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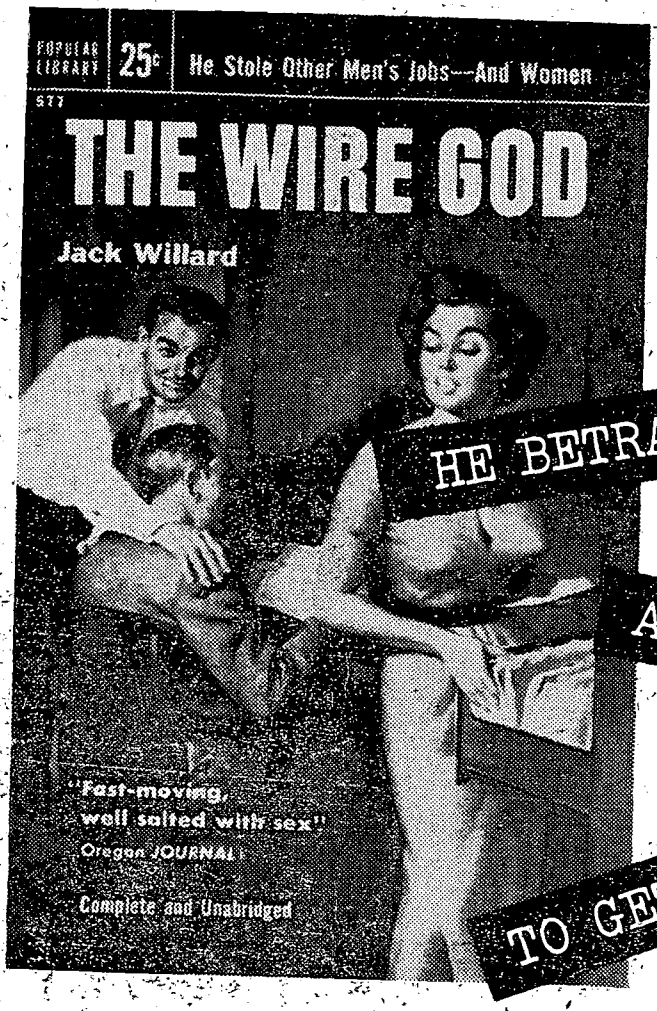

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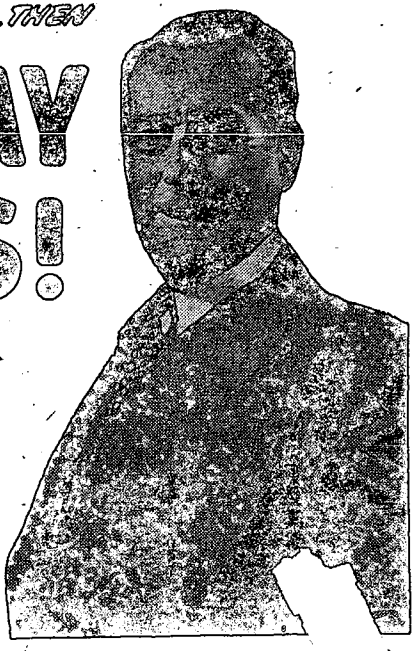

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A Science Fiction Department Featuring Letters from Readers

WE WERE gratified to learn the other day that mankind's existence on this planet, miserable as it is, is possible only through the gracious tolerance of the spiders. An English naturalist named Bristowe, taking a census of spiders in a Sussex meadow, counted a population of 2,225,000 per acre. Extending this coverage, Bristowe estimated the spider population of England and Wales at approximately 2,200,000,000.

Assuming that each spider eats only 100 insects a year, or less than one every three days, this brings up a total of 200,000,000,000,000 bugs a year polished off annually.

Since England and Wales together only bulk up an area equivalent to a few of our smaller states, extending this insectal horde to the rest of the world is enough to give ENIAC a headache. It is obvious that the sheer tonnage of insects involved would overpower mankind in short order were it not for the spiders. This in spite of all the DDT in the world.

The spider, a singularly self-centered creature, is no philanthropist, however, and there is reason to believe that he is less interested in mankind's fate than his own stomach. From the arachnid's standpoint, man must seem like a most presumptuous upstart. Spiders were ancient when homo first appeared on this planet, even in his earliest forms. Spiders appeared 300,000,000 years ago, man no more than 10,000,000. Spiders saw the Carboniferous age come in, saw the dinosaurs arrive, rule and perish. In fact, the huge reptiles themselves ruled the earth for 100,000,000 years—ten times as long as man has been around. The tremendously long tenure of the spider indicates good adaptability, even if the creature's intelligence does not seem to have increased significantly during this time.

The reaction of humans to spiders is curious. Most people dislike them in various degrees ranging from mild discomfort to outright screaming meemies. Yet there are people who like spiders. Case histories have been recorded of those who love to eat them—though this might not be defined as the same kind of liking. Certain aborigines enjoy roasted spider as a regular dish on the menu. And in more civilized parts of the world a few independent characters here and there have flouted tradition by catching and eating any spider they ran across.

Others have admired the spider's tireless industry, have written poems, have kept spiders as pets. In 1936, it is recorded that a London policeman stopped traffic to let a large spider cross the road. It is not known whether these people were aware of mankind's debt to the spider or were merely kind-hearted, but the debt certainly exists.

ETHERGRAMS

THE metaphysicians have their innings now and the bebop characters will kindly wait behind the plush rope until seats are available in the rear rows. The storm which follows was occasioned by Dr. Gunther's article in the last issue, THE SEETEE MIND. This was the first of four articles, exploring the possibility of a new system of logic which will be necessary

[*Turn to page 8*]

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(Continued from page 6)

if space exploration leads us to alien minds which think differently from ours.

ANALOGY AND THEORY

by Alastair Cameron

Dear Mr. Mines: I have read the article in your Spring issue by Dr. Gunther with some interest. One might ask for a more concrete development of the ideas contained therein, but perhaps that is his intention for future articles. However, Dr. Gunther appears to believe that an intelligence constructed of contra-terrene matter must necessarily employ contra-Aristotelian logic, a conclusion to which he comes by some metaphysical reasoning-by-analogy. It is the purpose of the present note to point out that this conclusion is not compatible with modern physical theory.

Contra-terrene matter is supposed to be constructed of anti-particles (Dr. Gunther appears to accept this premise). The properties of the anti-particles can be predicted on the basis of a quantum-mechanical wave equation proposed some years ago by Dirac. The anti-electron is the positron. It is like the electron in all respects except for its opposite charge and reversed magnetic moment, and these properties were correctly predicted by the Dirac equation before the positron was discovered. The anti-proton is the negative proton, which would also have a reversed magnetic moment; this particle has not been discovered in nature but it is hoped that the construction of higher energy particle accelerators will lead to its discovery (present machines do not have enough energies to create anti-nucleons). The anti-neutron we will call an anti-neutron; it differs from the neutron in having a reversed magnetic moment.

Now we can expect to construct seetee or anti-atoms out of the anti-particles in a wholly analogous way to the construction of ordinary atoms. Nuclear forces are thought to arise from the exchange of mesons among the nucleons in an atom. Present theory indicates that the mesons would interact with the anti-nucleons in the same way that they do with nucleons. Thus anti-nuclei would be constructed in the same way as ordinary nuclei; they would have the same energy levels and would differ only in having opposite charge and reversed electric and magnetic moments.

The anti-atoms would be constructed in the same fashion as ordinary atoms, since the electrostatic forces which bind the electrons to the nuclei are undisturbed by the reversal of all charges. The anti-atoms would build up into more complicated structures like anti-molecules and anti-crystals in the same manner as do ordinary atoms. The anti-molecules would have the same mass, same binding energy, same spectra, and same chemical properties as ordinary molecules, because none of these properties are affected by a complete reversal of charge. Anti-metals would have the same values of resistivity, magnetic susceptibility, Curie point, or any other measurable quantity as do ordinary metals. Thus the only remarkable thing about anti-matter is that if it were brought into contact with ordinary matter a mutual annihilation would take place, with the mass being converted into energy.

It is thus apparent that an intelligence constructed out of seetee matter would be unable to discover any difference between his world and ours on the basis of any physical property that he could measure. Hence Dr. Gunther is not correct in talking about "reversed neuronic reactions" which would take place in a seetee brain, for the physical properties of the seetee brain are the same as those of an ordinary brain. Furthermore, in principle there should be no trouble in communicating with a seetee mind, for light rays interact in the same way with each kind of matter, and they may therefore be used for communication.

I do not know what kind of physical foundation Dr. Gunther requires for his contra-Aristotelian logic, but I suggest that he not rely on seetee matter.—*No. 2, 2644 Lincoln Way, Ames, Iowa.*

Comment is withheld while Mr. Cameron's remarks are reinforced by a similar viewpoint:

VERY SPECULATIVE

by Martin Brilliant

Dr. Mr. Mines: I was about to point out to you that your letter column is strictly for the birds, but I see by your editorial preface to same that you not only know it already, but are actually proud of it. Still there are some things in it that irk me. I mean, you can carry nonsense too far, like letting Miss Nancy Share write her life story all over page 124. And then you thank her for her offer! Sam, do you know what she looks like?

But what bothers me most is your letting a metaphysician write an article. This is not only for the birds, but for the butterflies. Metaphysicians are noted for confusing other people, but I think Dr. Gunther has succeeded in confusing himself. I'd like to try to straighten things out by giving a scientific (i.e., correct) development of the idea of seetee logic—if you can stand the copious use (and misuse) of a few simple mathematical terms.

Dr. Gunther wants to extend the idea of contra-terrene matter to logic. Okay, but let's see first what contra-terrene matter is. Yeah, we all know, you build your atoms with negative nuclei and positrons floating around them,

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but let's take a good long close look at it, if we can stand the strain.

All physical quantities can be broken down into factors involving just four fundamental quantities—distance, time, mass, and electric charge. (This isn't the only way—you can pick up a few different sets of four fundamental quantities, but this is a convenient set). So if we want to build a seetee counterpart of some physical system, like maybe the solar system, we don't change distance or time, because we like to use the same space-time framework, we don't change mass because we don't know what negative mass is, and we just reverse all our electric charges. Let's call the change from terrene to contraterrene a transformation—to be specific, a C-T transformation, and what we wind up with is the CT-transform of what we started with. (Dig that crazy mathematical jargon—and hold onto your hat, because we've only just begun.)

So, to perform a CT-transformation on a physical system, we just perform a negative transformation on electric charges—we change every charge to its negative (recalling that the negative of something that's negative to begin with comes out positive.) So we next abbreviate "negative transformation" to "N-transformation"—to avoid some walloping semantic difficulties later on—and come out with the neat statement that a CT-transformation on a physical system is simply an N-transformation on charge. Just for practice, we make a CT-transformation on an electron and find out that the CT-transform of an electron is a positron.

Before we jump the gun and start trying to make CT-transformation on language and logic, lets find out some of the properties of the CT-transformation. These properties will obviously be the same as those of the N-transformation. So first, we try the N-transformation on numbers. We find that every number has only one negative, and that every negative is the negative of one and only one number. The negative of "five" is "minus five," uniquely and unequivocally, and "minus five" is in turn the negative of just one number—"five," uniquely. So we abbreviate all this nonsense by saying that the N-transformation is bi-unique. We can also find out something else of interest about the N-transformation by the same means. "Minus five" is the negative of "five"—but what is the negative of "minus five"? We find out that, very conveniently, this is "five," just what we started with.

If we want to reverse the N-transformation, all we have to do is apply the N-transformation again. Every number is the N-transform in turn of its own N-transform. The N-transform is therefore its own inverse, or, more succintly, the N-transform is self-inverse.

So now, having shown that the N-transformation is bi-unique and self-inverse, I am going to confuse things by calling every bi-unique, self-inverse transformation a sym-

(Continued on page 122)

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The SPIRAL

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of the AGES

A Novel by FLETCHER PRATT

He went back through time to change the world—and only his love for Barbara remained changeless. . . .

I

STANGER of physiology had a long, gloomy face and a jaw like a crocodile's but now the lines around it relaxed into a smile. "I suppose," he said, "you have been wondering just why we should invite you to lunch."

Robert P. Anthony, instructor in European history at LaGuardia Memorial College, looked around the little group that had gathered in a corner of the faculty club. There was dapper Dr. Gunther Hausleiter of Psychology, with his pointed white beard, and Aaronson of

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Nuclear Physics, his hair combed straight back from his forehead, and looking as though it were freshly varnished. All members of the Academic Council. "As a matter of fact, I have," he said. "Have I—?"

Stanger barely raised a hand. "No disciplinary questions have arisen," he said. "Quite the contrary. We need help, and we believe you are the member of the faculty best qualified to give it."

"Glad to," said Anthony. "What can I do?"

"Don't accept until you have heard the nature of the proposition," said Stanger. "It may be attended by a certain amount of—inconvenience." He glanced at his colleagues, and then, with the air of a man nerving himself to an effort, "We have built a time machine—and we're afraid of it."

"A time machine?" said Anthony with a trace of skepticism.

"Not as you would think," said Hausleiter. "It will not take you into the future to see the decline of the human race. We doubt whether it will take anything into the future, although the experiment has not been made. And its operation with regard to the past appears to be limited."

Anthony smiled. "Thus eliminating the old paradoxes about allowing you to go back and meet yourself or murder your grandfather, I suppose."

"They were absurd from the beginning," said Hausleiter. "Merely a form of dialectic."

Stanger cut in. "The thing is much more limited than the time machines of science fiction. We call it the Temporal Polarity Revisor, or 'tempolator' for short, by the way. It will not project physical objects of any kind. Clearly that would be a violation of the law of conservation of energy. What it does is revise—"

"The means of both perception and apperception," interposed Hausleiter. "You do not need to be a solipsist to realize that the world is what your senses make it. If those senses received a different set of impressions at some time in the past, they might have led you to make a different decision at the present."

"Don't you run into some paradoxes there?" asked Anthony.

"We don't think so," replied Stanger. "Our judgment is that there would be no essential change. That is, no suicides, robberies and so forth. But we don't know that's what we want you to find out."

Robert Anthony felt a certain thrill along his spine, and a slight moistening of his palms. "Why me, and how does it work?"

"I'll take up the second question first," said Aaronson. "Frankly, we don't know exactly how it works, any more than we can trace the precise flow of the currents in the liquid thermal diffusion method for extracting U-235. I began to get some peculiar results that suggested the use of nuclear power in parapsychology, so I went to Gunther and Wallace here, and we pooled the resources of our departments to build the thing. And we did get results."

Stanger said, "Tell him the whole story, Sidney. Might as well be a well-posted guinea pig."

AARONSON went on, "We tried it on a rabbit first. When it came out of the tempolator, its mouth was moving as though it were chewing."

"Showed no physical ill effects," added Stanger. "Completely normal."

"But the whole thing might merely have been an induced dream, a rabbit's dream of pleasure," said Aaronson. "However, in view of the fact that there were no physical ill effects, it seemed worth while trying it myself. I took a very short application that first time, and we weren't very familiar with the setting and control. The only result was that while I was under the influence of the tempolator, it seemed to me that I was in the lab, walking around and doing things as usual. Then I noticed that one of the plugs in the auxiliary circuit was loose, so I tightened it up. When I got back out of the tempolater, I remembered

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doing just that two days before."

Hausleiter said, "This simple act gave us our clue. For observe: the act was one of decision."

Aaronson went on, "The next time I tried it, we set for a longer exposure, and I rather deliberately tried to go back to the point of changing some minor decision I had previously made, to see what the effect would be. The trouble was that we hadn't thoroughly worked out the matter of pinpointing the spot in the past we wanted to hit, and I kept going back and reliving small sections of my life where there weren't any decisions to make, or where I merely did the same thing over again—at least as I remembered it."

Stanger grinned. "It seemed as though we merely had a device for total recall on our hands. Matter of fact, that was our original intention—till Sidney tightened the plug."

"We worked on the pin-pointing for three months. Sometimes I got back and tried to change a decision, but found I couldn't. I decided things exactly the same way as I had originally," Aaronson went on rapidly. "For instance, I remember once, after we got the pinpointing in fair working order, I determined that I was going to give my classes a cut and take the day off. But when I got there I didn't do any such thing. I simply went through the routine as usual. Another time, I decided to go back and flunk young Phillips."

"I don't blame you," said Anthony. "I have him in English History IV, and I've been tempted, too."

"Well, the temptation wasn't strong enough," said Aaronson. "When I got there, I found, just as I had before, that his examination paper was just good enough to get him by, although he hadn't kept up well. So I passed him. It was Gunther who finally hit on the clue. Tell him, Gunther."

Hausleiter raised one hand and began ticking off the fingers with the other. "First," he said, "It is necessary to conduct the briefing very carefully—to imbue with the spirit of the moment of decision. Second, it occurred to me, why should one wish to change a decision made in the past? For only one reason—because the decision was regretted. Without that, there is no true impulse to change."

"So I tried to remember a decision I wished I hadn't made," said Aaronson. "I'm going to let the others tell

Round and Round You Go

OLD Omar Khayyam would have been intrigued by the modern time travel story, having writ: "The Moving Finger writes and having writ, Moves on: nor all your Piety nor Wit Shall lure it back to cancel half a Line. . ." A number of science fiction writers have amended his proposition by luring the Moving Finger back for a rewrite as their heroes skitter back and forth in time. But the joke is usually on the hero—he finds the verdict of time stated in different terms, but remaining the same verdict. Herewith, another fabulous adventure in time, with some original and unorthodox results. Spiral describes it exactly—you go round and round, but you never cross the same point as you do in a circle. If you think your life is complicated, just eavesdrop awhile on Mr. Pratt's hero. . . .

—The Editor

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you about this part of it, because my memory of it is different."

"He wrote it down," said Hausleiter. "Without that we would not believe, even today. He wrote it down that he had a tooth filled by a dentist on 66th Street, and he was already sorry, because it was coming loose, and as he had merely picked the man's name from his plate on the door, it would be a decision possible to change. Then he put on the tempolator and tried it. A complete success."

Aaronson said, "The filling isn't a bit loose, and as far as I remember, never showed signs of being. And the name of the dentist I wrote as having gone to was completely unfamiliar. I remember going to quite a different man on a different floor of the same building."

"But look here," said Anthony, "doesn't this interfere with somebody else's past, too?"

STANGER shrugged. "There it is," he said. "We're inclined to believe that the case is one of non-vital interference. We've tried other lines. Doesn't work. Tell him about yours, Gunther."

Hausleiter grinned. "After Sidney's success, we thought we would check; he might have become prone to the tempolator or something. So I remembered going to a dinner of a psychiatrists' association, a tedious affair from which I returned with a case of indigestion. After careful briefing, I was placed in the tempolator. *Presto!* I can only remember staying home that night."

"What about the others at the dinner?" asked Anthony.

"Sidney called up the secretary of the association. He said I had not been at the dinner."

There was a momentary silence. Somebody went down the hall outside, whistling the "Whiffenpoof Song" and drawing out the last notes dolorously. Then Anthony said, "I still don't see—"

"You will," said Stanger. "After Gunther's experiment we knew we had something. Not how much. So Sidney took the next step. He set the tempolator for a time before he was born, back in the 1880's. Nervy thing to do, because it might have killed him. But it turned out all right."

Aaronson said, "We had to use place as well as time pin-pointing, because I didn't want to come to in the middle of a building that had been torn down. As a matter of fact, we don't yet know whether that represents a danger. But it worked out all right. I was on a farm in Jersey, and it was the 1880's all right, only I wasn't. Sidney Aaronson, I was somebody named Davis, and nobody paid any attention to me. The only way we can work it out is on a circular theory of the universe, and that we've somehow tapped in on a current-effect."

"Did you try to make any decisions in the 1880's?" asked Anthony.

"No, he didn't. That's why we're scared. That's why we called you in," said Stanger. "He didn't know how any decision he made might affect our contemporary present, so he didn't dare try it. He just lived on that farm for two days. The only thing he decided was whether to eat more potatoes or bread. But with you it's different. You're a historian, with your head screwed on fairly solidly. You have a sense of what are apt to be vital and non-vital decisions. So we want you to make the big experiment. We want you to go back to some point in history and try to change a decision to see what happens."

"It has to be a regretted decision?" said Anthony. "You want me to do something like preventing Burr from killing Alexander Hamilton?"

"Something like that," said Stanger, and, "If you truly regret the decision," said Hausleiter.

"What if I can't change it?" said Anthony.

"Then you will report that fact to us," said Stanger.

"And what will happen to me, myself," Anthony pointed to his chest, "while I'm off there somewhere in the wild blue yonder?"

"Nothing—we hope," said Stanger.

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"There appears to be a peculiar—and convenient—distortion of the time relationship in the tempolator. Sidney was on that Jersey farm for forty-eight hours by his computation, but he was under for less than that many minutes. The rule seems to be that the farther back you go, the less contemporary time it takes you. In a pinch, we could always give your carcass intravenous feeding."

There was a momentary pause, in which Anthony felt the others watching him, his mind darting rapidly over the tremendous possibilities the experiment offered.

He might prevent the assassination of Julius Caesar—no, someone had tried that, and it hadn't been successful. Invent the steam engine a hundred years earlier? No, nothing to regret there, and he wouldn't know how to put together a steam engine or have the materials. His mind flitted over possibilities.

"Well?" said Stanger.

"I'll have to think," temporized Anthony.

"Not to bribe you," said Hausleiter, "but you know there's a full professorship coming up in the history department, and I think the Council would be impressed by someone with firsthand knowledge of the past!"

That shot told; it was precisely the lack of a full professorship that was keeping Anthony from marrying a certain Barbara McGovern, the thought of whom he contemplated with the most delicious emotions. "All right," he said, "I'll try it!"

There was something like a sign of relief from the trio. Aaronson said, "How soon?"

"Give me a little time, will you?" Anthony replied. "You said I'd have to brief myself carefully on period to get the visualization or something accurate, didn't you? And we have that boxing match with Columbia next week, and I'm afraid I'll have to do quite a lot of work with some of the boys before they're ready for it. The lot of an amateur coach is not always a very happy one."

II

IT DIDN'T work out that way. In the first place, Capozzo, the 147-pound man, did all right for the first three minutes, but then insisted on dropping his right when left jabbed, instead of trying to right over the jab, and had to be given a long drill. In the second, Jerry Snider, the 175-pounder, always stepped back with both hands down after landing a right cross, waiting for his opponent to drop, and getting himself tagged in the process. Anthony had to peel down, get in the ring with him, and left hook him a couple of times before he even understood. As a result, he was tired, out of temper, and somewhat despondent about the Columbia match when he got to Barbara's apartment. And when he did, her parents were there.

They were a cross Anthony bore with whatever patience he could muster. Old Mr. McGovern had white hair and hands so thin they looked transparent; he dressed in the bygone style of 1910, when he had been one of the brightest young operators on Wall Street, and since he had lost his money, his mind seemed to have carried him back into that date. It was not merely that he could talk of nothing but Thomas W. Lawson, dinners at Delmonico's and Teddy Roosevelt; he insisted on discussing these topics at endless length, always ending with the brilliant suggestion that someone—preferably—Bob Anthony—should take them down, set them in order, and so produce a book that would make a lot of money for both of them.

But if anything, Mrs. McGovern was the worse of the pair. She dressed in a style which Anthony described to himself as "modern frou-frou" and kept the Social Register on the livingroom table to demonstrate that in spite of being no longer wealthy, her name was still in it. Her attitude toward Anthony mingled disdain and the insistence that he be suitably impressed with the privilege of being allowed social contact with so highly placed a family. As for marry-

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ing Barbara—well, that was something we could hardly consider at present, could we? And the worst of it was that instead of storming so that one could get decently angry and tell the old girl, she remained sweetly reasonable—so sweetly that daughter Barbara agreed with her most of the time.

Also she leaked; anything you said in her presence was all over town in twenty-four hours. It was clearly going to be impossible to tell Barbara about the time machine unless he could get her away from there. But Anthony was so full of the subject that he couldn't help launching into some of the ifs of history—if Napoleon had won at Waterloo, or the assassin had missed Henri IV and so on. That launched old Mr. McGovern on the theory that if the first Roosevelt, like the second, had accepted a third term, Kaiser Wilhelm II would never have dared antagonize America into the First World War.

WHEN he had finished, Barbara said, with a puzzled frown between her fine eyebrows, "Aren't both of you missing something awfully important?"

Mr. McGovern snorted. "Do you mean it wouldn't have made any difference if Teddy had been in the White House with his bog stick instead of that fool Wilson?"

"I don't know. It might have," said Barbara. "But I was thinking of something else. I was thinking that the physical actions and decisions decided upon are the consequence of background. They sort of have to have the idea before they can try it."

Mrs. McGovern said, "You can always tell a well-bred person in a few minutes."

"I think I see what you mean," said Anthony. "You mean something like the Romans never developing the steam engine—it was just about invented, you know—because they had so many slaves there wasn't any point in doing anything to save labor."

"That's it," said Barbara. "There has to be—something to start with. I know I'm putting it badly."

"No, you're not," said Anthony. "I see your point. It's that if every legend and tradition we had spoke of the virtues of monarchy, we'd probably be a monarchy today. Just as the Russians don't miss freedom today because there isn't any background for that sort of thing. So your idea about the decisive ifs would be when the traditions were formed. What if Homer had written it down that the Greeks didn't take Troy? Is that it?"

"Something like that. It might make a difference to us today. And there's something else. Something must have happened to make Homer put it down in just that way. What if it hadn't happened?"

"The interplay of idea and event," mused Anthony. "I must make a note to use that in one of my classes. It's really quite an original idea."

"People on our side of the family have always been original," said Mrs. McGovern. "My aunt—"

The thread was gone. Anthony suffered through the account of Mrs. McGovern's aunt's originality, then caught up another conversational ball that Barbara tossed him, and his good nature began to return as she suggested a walk. They were under the trees in Central Park before he told her about the time machine.

"It sounds exciting," was her comment, and then, after a moment, "What are you going to try to change?"

"I haven't had much chance to think about it. It's rather a problem. After all, there aren't so many historical decisions you want changed, and of those there are still fewer that one man could change. I don't think I'd look good trying to stop World War I or alter the course of the Russian revolution, for example."

"You might try your hand on the Salem witchcraft trials."

"I might. But the decision was to hold them, and I can't see any one person preventing that in the face of the wave of hysteria that was loose, that is,

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unless I turned up somehow in the mind of Cotton Mather." He smiled.

She hesitated. "Well . . . what are you going to do?"

"I'm not a hundred per cent sure. But you gave me an idea back there, with your interplay of idea and event. Do you know what a lot of our modern ideas are based on? Two things—the *Morte d'Arthur* and the *Chanson de Roland*. Both medieval. Why do we give our seats to women in a subway or a helicopter? The medievel idea of chivalry. Your mother—" he smiled wrily,—"owes a good deal of her ideology to that background."

Barbara said, "I see." Then she said, "But wait a minute. Both of those are works of the imagination. You can't get into a legend."

"On the contrary. Both are at least semi-historical. There was a King Arthur; there was a Count Roland and he was killed in a battle in the pass of Roncesvalles."

"And you want to accomplish something like inhibiting the growth of the idea of chivalry by preventing him from staying in the pass?"

He reached out and squeezed her hand. "Thanks, Babs. You're real good for my sense of logic at times. That wouldn't do, would it? I doubt I could persuade him if I got there, and it might not have that effect at all. Let's see; this is an experiment, and we have no idea how it will work out, so I guess I'll just have to drop the idea of trying for a specific effect and concentrate on changing a decision somewhere along the line. Mmm. . . ."

She said, "If you want—"

"Sssh. I'm thinking. It's got to be something that as of here and now, I'd rather see decided the other way. And those Frankish nobles were a pretty self-willed bunch. That limits things. . . . I think I have it; I'll take the other end and try to prevent Mordred from hatching his conspiracy against King Arthur."

She laughed. "You're incurably romantic, but I like it. Wouldn't you have to prevent Sir Lancelot from having his affair with the Queen, too?"

"I don't know. It may not be necessary. But as long as I'm going to get into this thing, I may as well get some enjoyment out of it."

She looked up at him. "It won't be —dangerous, will it, Bob? I'd rather hate to lose you."

"I don't think so, but you can talk to Stanger if you want. He's pretty careful. Shall we go back?"

THE *tempolator had a hood rather* like that of a permanent wave machine, except that it came down to cover the face fully. Just now it was hinged back, the electric leads giving it an oddly rakish air. Underneath was the dentist's chair that had been selected to seat the subject, relieved of its instruments of torture, and mounted on a metal plate. At one side was a battery of electron tubes and transistors, surrounded by mysterious connections, and at the other a bank of controls.

Stanger said, "I told her she needn't have worried about that. We use the radioactives only as a convenient source of electrons, and at the potential level where they get into the space-time current stream they aren't even radioactive any more. All right, Bob; roll up your sleeve, will you? I want to attach a sphygnomanometer, merely as a precaution, so we can get you out quick if things don't look right."

Anthony laid aside the copy of the *Morte d'Arthur* from which he had been getting some last-minute briefing, and took his place in the chair.

"You aren't going to enjoy the food," said Aaronson, testing the helmet before lowering it into place. "I know I didn't in the 1880's"

"It would have been better," said Hausleiter, "to accept my plan and prevent the drowning of Friederich Barbarossa. That one man could do alone."

Anthony leaned back, with his head in the head-rest. "All right," he said, "if I don't see you again, tell Sal I died with my boots on." He felt neither

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afraid nor worried, only excited and keyed-up, as though he were climbing through the ropes to face an opponent he knew only by hearsay.

Sight ceased as the hood came down, but he could hear Aaronson fumbling with the attachments, somebody saying something and the other person replying. There was a momentary pause. Then sound ceased, too. . . .

HIS first impression was that the experiment had failed. He was still in the same position, lying back with closed eyes. Then certain unevennesses in his resting place asserted themselves, and a voice said, "Will you not wake?"

It was a feminine voice.

Anthony's lids flew open like a shot, and he heaved himself into a sitting position to face the owner of the voice. She was worth facing. A wimple covered her hair, but from the blue eyes and peaches-and-cream complexion, he judged she was blonde, and the blue laced dress fitted her snugly enough in front to demonstrate that she stood in no particular need of a plunging neckline. Best of all he knew her name. It was Nimue.

"Come slugabed," she said. "If we're to dine, 'twere time we did so. See how the shadows climb the walls."

Anthony looked around and experienced a vivid sense of shock. He had expected the old British kingdom, lately abandoned by the Romans, and going down. Instead he was looking across a green lawn and a wide moat at a full medieval castle, gallant with battlement, shot-tower and spire, from which fluttered pennons, something that might have been drawn by Howard Pyle. Where one could see past it, the houses of a town were clustered, some with thatched roofs to be sure, but more of timbered construction. A bridge arched across the river between them and the town; Nimue was leading him toward it.

Before he could do more than wonder whether there had not been a maladjustment, a horn was blown somewhere, the castle gate swung open, and a troop of knights and ladies on horseback came pouring across the drawbridge into the meadow and toward the bridge. They were richly dressed in brilliant colors, the men with daggers at their sides, the women in elaborate hennins, and all were talking and gesticulating violently, as though they had just come from a political meeting which had broken up in a riot.

Most of the cavalcade had swept past Anthony and Nimue at a distance of about ten yards without appearing to notice them when the girl called, "Will you not tell us what are the tidings that rouse such a turmoil?"

One of a group of five quitted his companions and paced his horse a little toward them. "Tidings enough, and will make sad work for you, Master Pelle, if you are to set down justly the chronicles of the court. There's shameful death abroad."

He had a pointed black beard with a Spanish-like look, and one eye drooped a little. Anthony not only recognized his own name in this continuum as Pelle, but also knew this was Sir Agravaine, one of the five princely brothers from Orkney, and not one of the better ones. He said, "If you have time, I would be glad of the story."

Sir Agravaine turned in his seat and waved the four who were waiting for him to go on. "Why, here's the tale, and an evil one it is," he said, turning back to the pair. "The Queen bade us to dinner, four and twenty knights in all, and as many ladies. Now as we sat at meat, Sir Patrise of Ireland took an apple from the table and ate of it, whereupon he gave a dolorous cry and fell down in the hall and was dead at once. And Sir Lionel, that has some skill in leechcraft, says that other of the fruit placed by the Queen on the table was also poisoned. So the witch, the evil woman, has reached her term at last, and it will go hard with her now."

ANTHONY remembered well enough that Agravaine was one of the little group trying to strike at Arthur through Guinevere, but for the life of him he

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Anthony drove his blade into the joint at the base of the helmet

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could not recall this incident or how it came out. The thought flashed briefly across his mind that of course he couldn't; in his contemporary present the incident was just taking place and hadn't yet been resolved. He would have to play by ear. He said, "How so?"

Agravaine's Spanish-like face bore a smile that was cruel. "She will be impeached of treason for the death of one of the knights of the Table. What else?"

"Who is to charge her?" asked Nimue.

Agravaine shrugged. "I do not know. Sir Mador de la Porte most like. He was nearly related to Sir Patrise."

"A very honorable and puissant knight," said Nimue. "Yet the Queen should not lack champions."

He threw back his head and laughed. "Who? Who?" he said. "The witch outstepped herself when she invited us all to behold the death of Sir Patrise. Not one would be her champion in such a cause. *Tira-lira!*" He wheeled the horse, applied spurs, and went pounding after the others.

Anthony stood looking after him for a minute, feeling insufficiently acclimated. His information was all shreds, with patches of ignorance between, and he was just deciding that no briefing for such an excursion could be really adequate when Nimue, walking beside him, said, "I like it not."

"What? Agravaine's pleasure over seeing the Queen in trouble?"

"More surely. Yet even more I meant this tale. What! Guinevere of Cameliard to use poison? Have a man slain she might, but not by such means or in such a place?"

Anthony remembered. Nimue had the reputation of being a part-time sorceress. It probably just meant that she was a good free-hand psychologist. "I think you're right," he said. "It certainly doesn't sound like Guinevere."

They were crossing the bridge. Nimue said, "It girds me. Let us talk on it over our sup."

Anthony experienced his second sense of shock. At least he was eating with this girl. Was he also supposed to be living with her? He decided that when he came out from under the tempolator, his account would stand a certain amount of editing. Aloud he said, "What we need is to know more. Actually, all we have is that Sir Patrise died of a poisoned apple."

They were in the streets of the town now, and Anthony had studied enough history to know it was a good idea to keep back under the overhang of the upper stories and avoid things being dumped into the open sewer down the center. He looked around with appreciation, even of the charcoal-seller's cart that momentarily crowded them back into a doorway. There were going to be a few revisions in the Medieval History XXII course when he came out—if this really was representative, and not a product of his own imagination. There was more glass in the windows than he had expected and less noise in the street, for instance.

They passed a corner and turned into another street, Nimue leading the way with sure steps to a building crowded in among the others, where an enormous wooden shoe hung from an iron rod over the door. An off-key bell clanked as she opened it, and a little man in a leather apron popped out of a door at the back as they entered a shop filled with cobbler's tools.

"Ah, ah;" he said, rubbing his hands. "You are returned. I will tell Dame Giselle. Will you want candles tonight?"

"Nay," said Nimue, and looked at Anthony, "unless it be my lord's intimate desire. Today we make holiday, and there are no sheepskins to examine."

THE COBBLER bowed and ducked back in again. Nimue led the way to the back of the shop and up a dark stairway to a landing which gave on a chamber running across the front of the building and into a backward L. There was a fireplace at one end, and opposite it a high writing desk with manuscripts. In the center stood a table set for two; the L held a big canopied bed, and Anthony experienced a sensation of famili-

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arity and comfort which told him he lived here. Nimue walked to one side of the room, undid her wimple and flung it over the back of the chair, then seated herself at the table. Her hair was blonde.

"A fair day, but a bad ending," she said. "And an evil deed done. Why slay Patrise?"

"Why indeed?" said Anthony, taking his own place. "But even if the Queen is impeached, I don't think she needs to worry. When you've got anyone like Lancelot always ready to fight for you, you're not in any real danger."

The door opened and Dame Giselle came in with a steaming dish of food. Nimue helped herself, then looked at Anthony curiously across the plate. "Have you forgot so soon, my lord?" she said. "It is now a month since he has quit the court, it is said on the Queen's forbidding, and no one knows where he may be."

"Oh," said Anthony. "That makes it serious, doesn't it?" Aaronson had been right; he didn't like the food. It had too much salt and not enough other things, and he felt squeamish about dealing with stew with his fingers, even though they seemed to be handling things all right. Suddenly it struck him that there was some compulsion, some idea implanted in his mind, some reason he had come here, something he must do, though he could not remember precisely what it was. He said, "I wish we knew more about this. I wish we could talk to somebody who was there."

Nimue smiled at him. "As ever, you will be knowing more than others of things past. Yet I think this time you may be gratified, for Dame Blahaine, that is leman to Sir Bleoheris de Ganis, was among those who rode past us, will surely tell all you wish to know, since she is a friend of mine. Shall we seek her after meat?"

He drank from the leather jack of beer and made a face at the taste of it. Dame Giselle, who was waiting with the towel and basin, evidently interpreted this as a signal, because she came over to help him wash his hands. There were a few little tricks of medieval life he'd have to watch out for. He said, "I think that's a rather good idea. They're not far from here, are they?"

IV

SIR BLEOHERIS de GANIS lived on the third floor. He was a tall man with a thin, ascetic face and hair turning gray around the edges. He was seated in a big chair fondling the girl on his lap as they entered, an occupation he did not offer to stop. There was a flagon of wine on the table beside him. Nimue greeted the girl; this must be Blahaine.

They found chairs at Bleoheris' invitation, and there was a little silence, Anthony waiting for Nimue to give him a lead. Blahaine saved her the trouble by wriggling round in Bleoheris' arm and saying, "Heard you the dreadful tidings?"

"Only just that Sir Patrise was dead," said Anthony. "We came to you, hoping you might be able to tell us how it happened. If I am to set it down I must have a true story."

Bleoheris drank and said gloomily, "I fear it is but too clear. The Queen is become a destroyer of good knights. She must be under an enchantment. Yet this will hardly save her."

"I could put a name to the enchantment," said Blahaine. "I would name it Lancelot, who has so filled her with despite—"

Bleoheris lifted his disengaged hand and slapped her sharply on the cheek.

She was on her feet in a swirl of skirts. "Faitor!" she cried, her head thrust forward. "If—"

"Peace," said Bleoheris, lifting his hand. "Shall I permit a leman what I would not allow a wife? Alas, that our noble fellowship should be harried by such babbling! There are those who would profit if strife could be set between Lancelot and the King, and you would help them."

It flashed across Anthony's mind that the purpose he could not remember was

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somehow connected with this. With the air of a person quickly changing an unpleasant subject, Nimue said, "But if Sir Mador de la Porte impeaches the Queen, who will stand her champion, gin that Sir Lancelot cannot be found?"

"I know not." Bleoheris shook his head. "Certain it is that not one of the four-and-twenty at the meal would adventure himself against a knight of such proof as Sir Mador in so bad a cause. We all saw it with our own eyes how the Queen did empoison him."

Nimue said, "It has reached me by my arts that we may not yet have a full tale here, and Master Pelle is one with me in thinking we should not have less."

Evidently Nimue's reputation for sorcery commanded respect, for both of them looked hard at her. Bleoheris said, "What more's to tell? We saw it."

Anthony leaned forward. "Ah, but just what did you see? With your own eyes, I mean, not what you heard from anyone else."

The knight stared at him. "Why, Sir Patrise writhing on the floor with part of the poisoned apple beside him. Would you need more witness?"

"No, no more. But from how far away did you see it?"

"Three rods or perchance more. I was about mid-table. But I was not deceived of my eyes."

"I don't suggest it. I was just trying to get the picture straight. Then this all happened at one of the ends?"

"Oh, aye. The Queen's. He died at her very feet."

Blahaine said, "This I will say; she looked like a woman horror-struck."

Anthony rubbed his chin, considering. There seemed to be some clue here that was just barely eluding him. Nimue said, "Well she might, guilty or no. To have the honored guest fall so—"

BLAHAINE said, "Nay, Sir Patrise was not the guest of honor. A good knight, but not of such degree. That was Sir Gawaine, with his four brothers."

A relay snapped into place in Anthony's mind. He said, "I wish you'd just explain the seating arrangement for me. As far as you remember it."

Blahaine put one finger to her cheek. "At the head, the Queen. On her right, in the place of honor, Sir Gawaine, and sharing his plate his lady, Ettard. Next Sir Gaheris his brother and his lady, Joyzelle; then Sir Gareth and the lady Lionors—"

"And King Arthur wasn't there?"

"Nay. He likes not these feastings overmuch."

"I see. Who was opposite Gawaine?"

Blahaine frowned a little. "I am not right certain, having been on that side of the table myself. But I mind me it might have been Sir Palomides or Sir Pinel de le Savage."

"With ladies, no doubt?"

"But surely."

"All right," said Anthony. "Then how did Sir Patrise get there?"

"Oh, the trumpets had blown, the meats and pastries were taken up, and we were having such joy as we might over each others' presence with the wine. Sad joy! I wit well Sir Patrise had left his place, for he gave me a light pinch in all jollity as he passed."

"Any of the others move around like that?"

"Oh, aye. Sir Gawaine had left his place to go below the table and speak to La Belle Assoile, that is wife to Sir Ector de Maris."

Anthony said, "Thanks a lot. I think I can write down a good true narration of things now. Shall we be leaving, Nimue?"

When they reached the street dark had fallen, relieved only by an occasional torch in a rack at a corner, and there seemed to be practically nobody about. Anthony reflected that the Middle Ages always went to bed—and got up—with the sun.

As Nimue picked her way along, clinging to his arm, she came to a stop at one of the corner-lights and looked up at him.

"My arts tell me, my lord, that you found somewhat of moment in this tale of the dinner," she said.

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"I certainly did," he said. "Whoever it was put that poison out got the wrong man. How could anyone—whether it was the Queen or someone else—know that Sir Patrise was going to leave his place and come up to the honor end of the table?"

"Then—*oh!*"

She stopped suddenly, looking at him.

"What is it?"

"The trap was laid for Gawaine. He has a custom that he daily uses at dinner to take fruit, but most especially apples."

Now Anthony stared. "But why should Guinevere wish to poison Gawaine? Hasn't he always been one of her strongest supporters?"

"Aye, and against many. It would be more like—"

"What?"

"Sir Pinel le Savage. He was cousin to that Lamorak de Galis whom Gawaine and his four brothers slew, do you not remember? And he has a wild, ungovernable temper that little can restrain."

"And Sir Pinel had the chance, too, hitting right across the table. He could have slipped that poisoned apple in easily. I'm going to take this to the king."

Nimue said, "Softly. That were not well done."

"Why not? Isn't King Arthur a reasonably just man, especially where the person concerned is his Queen?"

"Pelle, though I love you and have great joy of you, at times I understand you not. You would charge Sir Pinel of this deed; where are you, an unknighted man, to find a champion against him? And no less than a champion will be needed unless you have proof positive. More like you would find yourself at the burning-stake for falsely accusing so worthy a person."

HE HAD forgotten the type of mind, and that status guaranteed an honesty that could only be disproved arms in hand. He said, "Couldn't we find the proof positive? He must have got the poison from an apotheory or something."

A cat galloped across the shadows of the deserted street and Nimue made a little despairing gesture. "How shall we hunt this down in time? Tomorrow Sir Mador de la Porte will go before the King to impeach the Queen of high treason; after which it is a thing decided that she must appear with a champion or be burnt to shameful death."

"Then anything we do has to be done by morning?"

"Aye."

There was some reason why this had to be prevented. Anthony said, "Then whatever we do has to be done tonight."

"Most true."

"I can think of only one thing possible to do. That's hunt up this Pinel and squeeze it out of him. Make him confess. Do you know where he lives?"

"But that would be most foul shame to a dubbed knight."

"After all," Anthony said, "It wasn't a very nice trick to poison a man and let Queen Guinevere take the blame for it, either. Is that the kind of knights King Arthur wants at his Round Table?"

She threw her arms around him suddenly. Somewhere above a window creaked open and something was thrown into the center of the street with a plosh! "Nay. You are right, and we'll seek him out in his dastardry. But oh, my love, you rush on too fast. This is a very powerful knight, who will have sword and armor in his bed-chamber, and you with nought but a little dag. We must think deeper on it."

She was delicious and desirable in his arms, and unconscious memory told him there was no joke about this, but there was something more on his mind than just Nimue at the moment. "Do you have any ideas?" he asked.

"Only this: a man is never so helpless as when he would be with a woman. Now we will go to the pavilion which Pinel keeps at the edge of town, and I will make pretense that I am utterly overcome with love and longing for him. But when he would take me to his room, then I will cast my arms around him and cry out, and you, waiting in the dark, shall come and take him."

Anthony said, "Oh, but listen! I

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couldn't do that."

She gave a little laugh. "What, so nice? You were not so a moment gone. But if my plan does not please you, make a better."

He would never get used to the way these people thought. "I—well, all right, let's try it."

She released him, put up her face to be kissed, said, "Come," and giving him her arm, led down the street, around a corner, past a fountain that burbled quietly in a public square, and along another alley-like street. Overhead the sky was clear and bright and there was enough star-shine to show the way.

It occurred to Anthony that it was fortunate that Camelot was not a very large town.

The huddled-together houses suddenly fell away, and they were tripping along a track scored by cart-wheels, past scattered cottages. Anthony said, "You seem to know the way rather well, even at night."

Nimue squeezed his arm and giggled. "Nay, you shall not draw me so," she said. "Did not you yourself bid me learn where various lodged, the better to put it in your chronicle? Here."

THE pavilion, from the loom of it about the size and shape of a Swiss chalet, was set well back from the track and surrounded by a jungle-like growth of bushes. It was dark. Nimue led the way confidently to the door, whispered, "Crouch down," and was gone from contact, he judged around toward the side of the building. He heard a soft tapping, a pause, another, then the creak of a hinge, the burr of a masculine voice and something he could not quite make out from Nimue.

Then she was back almost beside him. He felt his heart beat rapidly and a lively sense of peril as the door swung open and a heavy voice said, "This way, oh star of the night."

Silence.

A dozen thoughts chased each other through his head, including the one that he had been extremely trusting of Nimue on what might be described as a very short acquaintance.

More silence.

Anthony urged himself slowly to his feet, moving carefully to avoid making a sound, and poised, hand on the door.

She screamed.

He whipped the door open with one hand, snatching out his dagger with the other, and guided by a second scream, leaped across the room inside, upsetting some kind of footstool in the process, but fortunately not going down. In the dark his left hand hit a shoulder, ran up it and clutched a handful of beard. He said, "Be still. I have a dagger here and I'll let you have it if you stir a muscle."

The man who owned the beard made one convulsive move as though to dispute the point, then subsided as Anthony let him feel the weapon and began to curse with a richness and variety Anthony had not known the Middle Ages to possess. He could feel Nimue climbing over the man. "Strike a light, will you?" he said.

"A moment. . . ." came her voice from the darkness.

"Traitress!" bellowed Sir Pinel.

"Stop that or I'll let you have it," said Anthony, and dug him with the dagger to show he meant it.

A light flickered into being to show that he was holding down a big, black-bearded man on a pile of deerskins. The eyes regarded him malevolently. Without turning his head Anthony said, "Can you find something to truss this beauty up with? I don't think he likes it this way."

"A moment," said Nimue's voice. The light moved as she stirred in the background, then became steady. There were sounds of minor activity, then Nimue *barefooted and clad only in her shif* came into the field of vision with some strips of leather, one of which she expertly bound round Sir Pinel's ankles.

"I cut up a bridle," she said. "'Twill do as well as another."

"Put your hands together, sweetheart," said Anthony, and gave him another jab with the dagger.

"My best bridle," said Sir Pinel.

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"You will lose your ears for this, Master Pelle, if not more." He was powerfully built with a long scar from his left shoulder down into the hair on his chest.

ANTHONY relaxed and looked around as Nimue slipped into her dress and began to lace up the points. Sir Pinel certainly did his best to live up to the other part of his name. The whole place looked like the inside of a cave with animal skins and weapons tossed about carelessly. He addressed the man on the bed ,who seemed to have settled down to a more or less philosophical acceptance of his plight, "All right, Sir Pinel," he said, "we know you poisoned the apple and put it in the dish for Gawaine. All you can tell us is who sold you the poison."

Pinel's mouth came open and his eyes bugged. "Sorcery!" he exclaimed.

"Call it anything you want to as long as you realize the show is over," said Anthony. "Where?"

"I—do not know." The mouth was sullen.

Anthony stepped nearer, exhibiting the dagger. "Maybe an inch or two of this would help you remember."

"I do not know," the man repeated. Anthony started to lean over, but Nimue beside him touched his arm.

"My lord," she said, "by my arts which you know of I perceive he speaks truth. It is not in his knowledge from whence the venom came."

"But how—" said Anthony and then stopped. Of course, she was right. Even if Pinel was a murderer, he was still under the laws of knighthood and would tell the truth. But that wouldn't keep him from evading the issue by not expanding on his answer. He considered, staring at the man on the bed, who stared back for a minute, then looked the other way.

"All right," said Anthony, "then you didn't buy the poison. Somebody else did and gave it to you, isn't that it? Who was it?"

Sir Pinel didn't answer.

Nimue said, "Let me but try," and addressed their prisoner. "Hearken, Sir Pinel. Your life is doubly forfeit as having slain Sir Patrise and placed the Queen under attaint of impeachment for the deed. Thus we should deliver you to the King's justice in the morning, bound as you are. But though your hatred of Gawaine made you a willing partaker, it is not our desire to strike down the servant and leave the master untouched. If you will even tell us, I will tie your hands with a cunning knot, so that by little and little you may work them free before day and be off to France or Italia or where you will before the matter's public."

Pinel's eyes went from one to the other. "Your oath on it?"

"My oath on it," they chorused together.

"Well, then, it was Mordred. He came to me with the plan and found the venom."

Anthony could hear Nimue's gasp of astonishment. "His brother!" she cried.

He grinned. "I think I can explain that one," he said. "There are some things that fall in a chronicler's department. Look, if Arthur were killed in a tournament tomorrow, wouldn't the succession fall to the eldest son of his sister Margawse? That's Gawaine, isn't it? But if Gawaine were also eliminated, it would go to the second son—"

"Mordred!" finished Nimue.

"The Queen hasn't borne Arthur any children yet, but she still might. So Mordred's little plan was arranged to take care of that, too. And he arranged things so that if Guinevere escaped the charge it would come right down on Pinel here. You were a fool, my friend."

V

THE hall was long with high windows through which the sun streamed to lie in intricate patterns on the floor. The slender pillars that divided it into aisles ceased near the throne end, leaving a cleared space around the dais. It was filled now with a moving throng of men and women talking in low tones. Nobody

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seemed particularly happy. A tall man with a square jaw and two green chevrons on his tunic was the center of a little group, shaking his head from time to time, and wearing a determined expression. That would be Sir Mador de la Porte. The five sons of King Lot were together as usual, Gawaine looking rather heavy and with his mouth down at the corners, Mordred's dark face that seemed to wear a perpetual sneer set off by the small red cloak flung back over his shoulder from a brooch at the breast.

Nimue said, "Be ruled by me; do not come forward till the appeal has been made."

The trumpets blew and, preceded by pacing heralds, Arthur and Guinevere came together down the hall as those of the court split to right and left to admit their passage. The King's blond beard was lightly touched with grey, and he wore a look as unhappy as Anthony had ever seen on the face of a man; she was pale and looked neither to left nor right as they went up the dais and took their places on the thrones. The lane through which they had come closed up with a soft shuffling of feet, and for a moment a breathless hush of expectation hung in the hall. Then Sir Mador de la Porte stood forward and said, "My lord king, I require that I may have justice. I have lost a good knight of my own blood, and I impeach the Queen of treason in the low degree in that it was her doing."

Arthur stood up. "I do not believe this accusation, but I may not myself take part in this matter," he said, "since I must remain aside as judge. Yet I beg you not be hasty, Sir Mador. For it is not yet determined that she did this; nor is she so friendless that she will be without a champion who may overthrow you."

Sir Mador said, "She made the dinner, and this must have come by her or her servants."

Nimue nudged Anthony. He squeezed his way forward and said in a loud voice, "Not so."

Sir Mador de la Porte turned on him fiercely. "What! You would dare!" Anthony could hear a kind of angry murmur behind him, and was aware that he had broken a taboo.

King Arthur said, "All who have business in this court shall be heard fairly. Chronicler, say your say."

Anthony said, "The Queen made the dinner, but the poisoned apple was placed in the dish by Sir Pinel le Savage. I charged him with it last night. He confessed, and I think he has fled."

The murmur behind him suddenly doubled or trebled in volume, but it was no longer so unfavorable. Arthur said, "Will Sir Pinel answer this?"

"He can't because he isn't here," said Anthony. "And that isn't all. He put the apple there, being in a position to do it. But the man who supplied the poison and who put him up to it was Mordred."

The words hung for a breathless instant. Then as the babble broke out again, Mordred stepped forward, his dark face flushed. "My gracious King," he cried, "I ask that this man be whipped from your presence as a most foul liar who brings disgrace upon us all. Who ever heard so fantastic a tale?"

With a momentary sinking of the heart Anthony realized that he was playing in fast company, but before he could answer, Nimue's clear treble rang out, "I bear witness that all Master Pelle has said is true. With my own ears I heard Sir Pinel confess this deed and declare that it was Mordred taught him. By my arts I know this to be true, but if you seek further proof, go to Pinel's pavilion."

Anthony was watching Mordred, who seemed not in the least abashed. Instead he stamped his foot furiously. "Now," he cried, "this is the greatest shame! For this man who impeaches me is not even of the order of knighthood, so I cannot make him account his falsehoods."

Something like a smile played around King Arthur's lips. "That can be mended," he said. "Advance and kneel, Pelle."

Anthony's legs carried him up the dais

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to the foot of the throne and he knelt. He felt a light tap on his shoulder, "Rise, Sir Pelle, knight *in extremis,*" said the King's voice. "You have our favor."

It occurred to Anthony that he would need something more than favor. This Mordred might be an unmitigated scoundrel, but he was a solidly built hunk of man, and he undoubtedly knew more about the use of medieval weapons than Anthony would ever learn. The same thought had apparently struck Nimue, too. She looked at him anxiously as he rejoined her. King Arthur was saying, "Now I do appoint it you, Sir Pelle, shall meet Sir Mordred in the meadow beyond the castle at such time as shall please you, but not to exceed fifteen days' space. And since you have no great schooling of weapons, you shall choose what manner of combat it is to be. Sir Kay will see to your arming."

He signaled the heralds, the trumpets blew again, and King and Queen took up their processional march down the hall. Anthony noticed that while Agravaine had joined Mordred, the other three brothers were considerably apart, talking among themselves.

SIR KAY, a lanky man with a long, drooping mustache, was approaching, accompanied by a burly man with curly black hair, who would be Sir Marhaus. The latter spoke first. "Sir Pelle," he said, "under permission it seems to me that you are not likely to enjoy your dignity for long if you must deal with this Mordred, for he is a very strong notorious fighter. Now there are those of us who like him somewhat less than well, myself among them. So that if you wish and the King permit, I will be your champion this day fortnight."

"Thanks," said Anthony, and meant it. Marhaus was the third or fourth best knight of the Table.

"It will not be permitted," said Kay. "It is written in the 'Advices' that no knight may be championed by another unless he be so sick or wounded he cannot defend himself. Shall we go to the armory?"

"Well, I will even go with you there and help you choose weapons," said Sir Marhaus. "Some of us know this better than others."

The armory proved to be a big room facing the inner court of the castle, rather dusty, and with two or three men at work sewing straps or furbishing pieces of gear. Sir Marhaus said, looking Anthony up and down, "You're a good man of inches. I would say fight him on foot and with battle-axes if you have not too close acquaintance with sword or lance."

Anthony looked round. Suits of full armor hung on the wall, and they looked heavy and hampering. So did the big longswords next to them. Sir Kay said, "Battle-axe or mace. It is harder to avoid a blow with the smasher from an inexperienced hand than one given with the edge."

If he could only apply his knowledge of boxing somehow. These broadsword men were all cutters and slashers, or to put it in boxing terms, they threw nothing but hooks and overhand rights. A straight puncher ought to be able to beat them to the punch often enough to have a chance. But for that you'd need a left jab to keep your man off balance, and what the equivalent of a left jab with this kind of weapons would be he hadn't the faintest idea.

Sir Marhaus was conceding that there might be something in the mace idea, if used with a dagger for a quick spring in to throw your opponent to the ground. Suddenly Anthony stopped. "What's that?" he said.

"That" was a shield, hanging in a section devoted to them. Instead of being kite-shaped or triangular like the others, it was round, with a heavy metal edge and metal binding. But the thing that had drawn Anthony's attention was that from its exact center there protruded a stout metal spike, at least a foot long. The left jab.

"Something left here by Sir Persaint of Inde," said Kay. "A weapon of his own country. It is of little use."

"It will be of a great deal of use to me, if I can find the kind of sword I

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want to go with it," said Anthony.

"Ho—ho!" said Marhaus. "A fighter by craft. You may not need a champion after all."

"What manner of sword?" asked Kay.

"A straight one, as long and light as possible, with a good point," said Anthony. "I don't much care about the edge. And I want a good helmet and heavy shoulder plates. The rest of the armor as light as possible; just enough to keep out a glancing blow."

NIMUE kissed him before he put his helmet on, and Sir Marhaus helped him lace it. The narrowness of the eye-slits made seeing difficult, but as he turned his head he could see the court clustered around the edge of the meadow, just out from under the trees. Two knights, full armored and with halberds, were at either side to keep the lists, and a herald stood by the King with a staff in one hand and a trumpet in the other. Beyond, Agravaine was tightening his brother's breastplate, talking to him the while. Mordred's sword was one of the long ones that could be used with two hands, and that was a relief; he ought to be fairly slow with it one-handed, and if he used both he would have to abandon the protection of his shield for long enough to open the way for a thrust.

"Are you prepared?" said Marhaus.

"Yes," said Anthony. His voice boomed in the helmet. Across the swatch of green Agravain signaled that his man was ready, too. The trumpet blew. Anthony heard someone shout, "God defend the right!" and Mordred came trotting toward him, sword half uplifted. He moved very fast for a man carrying all that armor.

Circle toward his shield side, Anthony remained himself; he hasn't got a left. Mordred swung his sword in a tentative chop which Anthony caught on his shield, keeping his guard high. He countered with a side swing toward the head, and Mordred showed he knew about circling, too, coming back immediately with a long overhand swing that came down with jarring force on Anthony's helmet before he could get his shield up, and then rapidly with two more blows at right and left shoulder.

This wasn't going to be easy, Anthony reflected, trying a quick one-two, both of which Mordred blocked easily before aiming a cut at the head and coming out of it with a backhand slash at the face which Anthony only just did manage to block with his own blade. He hadn't tried thrusting yet; that would have to come as a surprise.

Suddenly Mordred went into a whirl of action, bang, bang, bang, as though he had taken the measure of his opponent and knew exactly what to do. It was all Anthony could do to hold off the blows without striking back, and once when his foot gave a little, he realized that being knocked down in this game was just as bad as being knocked out.

Mordred aimed a vicious cut at his legs that Anthony managed partly to block with his shield, with the feeling he had drawn some blood. Anthony cut back in the same direction. Blocked. Mordred took a step back, then came forward again, and once more began the rain of blows at the head. Suddenly Anthony realized it was a routine, and if a routine, an opportunity. He didn't attempt to retaliate, waiting for the cut at the legs. The sword swung back for it; Anthony stepped in and thrust the spiked shield forward with all his strength.

The point jarred against Mordred's armored forearm, taking all the force out of his blow. He reeled, lowering his shield a little to catch his balance, and in that moment Anthony drove his blade into the joint just at the base of the helmet.

It must have taken his throat out.

VI

THERE was light and he was suddenly hungry.

"Feel all right, old man?" said a voice.

"Fine," said Anthony. "How long was I under?" The faces that confronted him looked somehow different. No, it wasn't the faces, either, he de-

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cided. It was the clothes. He hadn't noticed that Anderson, who usually dressed so neatly, was wearing a particularly baggy suit of tweeds that day.

Stanger said, "Just under six hours. How did it work out? Do we have confirmation of the theory?"

Anthony climbed out of the chair and stretched. "Which theory?"

Stanger looked surprised. "The circular universe, the closed time-track, to be sure? What other did you think I meant?"

"I don't know about that. I'm rather certain I succeeded in altering one decision in the past, though. Mordred's conspiracy didn't succeed. The last I saw of him he was in a fair way to becoming a corpse before it could get going."

The three faces looked at him with varying degrees of astonishment. Dr. Hausleiter said. "Of course, history's your specialty and not mine, but I never heard of a conspiracy by Mordred. Didn't know he was important enough to figure to make one."

Now it was Anthony's turn to look astonished. "Am I going crazy?" he said. "Or wasn't that the whole purpose of the experiment—to see whether I could change a decision in the past?"

"The purpose of the experiment was to check our closed time-circuit theory," said Stanger, firmly. "I say, old man, do you mind having an examination?"

"Not in the least," said Anthony: "I feel fine and haven't anything to hide."

"Let's use my office," said Hausleiter. "I will need my equipment."

It was at the other end of the building, past the entrance. As they went down the hall Anthony noticed that the portrait of Mayor La Guardia which usually hung facing the door had been replaced by that of a florid looking man, and hung in orange and blue. They were not the college's colors.

"Freshmen up to tricks again," he said, waving at it. "Wonder how they picked the subject?"

Dr. Hausleiter stopped in his tracks. "Do you mean to tell us you don't recognize Duke Bernd?" he said.

A horrid suspicion entered Anthony's mind and began doing flip-flops in the corners. He gazed at Hausleiter, then at the others, then around, and regardless of Aaronson's "Hey!" ran across the lobby and down the flight of steps to the entrance to look out across Central Park. As he had feared, the line of towers along the eastern edge—Sherry-Netherland, Pierre, the Hearst building, the new General Cooperative—was definitely not visible.

He turned back up the steps to face the trio, who had followed him, with anxiety in their faces. "It's all right," he said. "You don't need to give me an examination or write out a ticket to the booby-hatch. Your closed circuit theory is probably correct only the circuit didn't quite stay closed. I'm a refugee from another time-scheme."

Hausleiter grunted, Aaronson gave a smirk of triumph and said, "I told you so," while Stanger said, "Do you mind letting me look at your eye, old man?" and produced a tiny flashlight. Anthony stood obediently while the light was flashed in one eye. Stanger peeled back the lid, said: "Clean bill of health so far," and then: "I say, let's step along to your office, Gunther, and get this straightened out."

AS THEY went along, Anthony said, "By the way, now that you know I'm not dangerous, who is Duke Bernd?"

"Bernd IV Rensselaer, Duke of the Free City of Manhattan," said Stanger, "but let's keep it till we get there, shall we?"

"All right," said Anthony, "but unless you have one in your office, I think somebody had better stop for a map. It will help orientation."

"Will do," said Aaronson. "Wait for me, though. I don't want to miss any of this."

Hausleiter threw open the door of the office on furniture that was more

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solid and less upholstered than Anthony remembered it, and produced from a box long slender cigars that Anthony didn't remember at all. He remarked, "I think we must be very careful about any announcement of this until we understand the implications."

Stanger seated himself and lit up. "I agree. The academic body—ah, here's Aaronson."

Anthony said, "To begin with—"

Stanger waved his cigar. "To begin with, I think we had better systematize this exchange of information. It's perfectly clear that Anthony here either really is or thinks he is what he called a refugee from another time-scheme. I'm being perfectly frank, you see, not ruling out any possibilities. Now I propose we take turns asking questions. We've already answered one of yours—about Duke Bernd. Now I have one for you—who do you conceive yourself to be?"

Anthony said: "Robert Powell Anthony, instructor in history at the La Guardia Memorial College of New York. And the date is, or should be, June 26, 1978."

They drew breath. Hausleiter said, "The date is right, but what is New York?"

Anthony said, "My turn. I want a look at that map."

Aaronson spread it out. It was a good map of North America, with the familiar outlines of rivers, mountains and lakes, and cities in the places where they ought to be, though many of them bore unfamiliar names. But what caught and held Anthony's attention were the lines and colors indicating political divisions. A boundary-line ran straight up the Hudson, split off at the Mohawk, jumped to Lake Ontario, emerged again from Lake Erie west of Buffalo to strike the headwaters of the Allegheny River, followed it to the Ohio, to the Mississippi, climbed that river to the Missouri, followed it to its head, zigged across the Rockies to catch the Columbia and so reached the Pacific. Everything north of it was labelled "Norrland;" south of it, taking most of what he had known as Mexico was "Virginia Estates;" New York City and Long Island were a different color.

Hausleiter said, "Now I will ask. In using the temporal adjuster machine, what was the purpose of the experiment?"

Anthony said, "Why to see whether I couldn't alter some decision taken in the past. And I did. Mordred didn't succeed in breaking up King Arthur's kingdom. Though I don't see. As it was mostly legendary . . ."

HE LET his voice trail off and the others looked at each other for a moment of silence. Then Stanger said, "I'm going to volunteer a piece of information that you can regard as an answer to a question or not, but it will help us understand each other. There was nothing legendary about Arthur's kingdom. It was the kingdom of England, which still exists today." He tapped the map. "The Virginia Estates are part of it. The present King is Owen VI."

"Good heavens!" said Anthony. "The ideological change must have gone pretty deep, and really shifted things in the time-circuit. But if Arthur's kingdom stood up, what happened at the time of the Saxon invasions?"

Again they exchanged glances, and it was Aaronson who spoke. "I'm not so very sure of my history, but if they're what I think you mean, it was the movement of the Scandinavian peoples that started back in the reigns of Gawaine II and Gareth III and ultimately resulted in the colonization of Norrland. May I ask a question now? In your sector of the time-track, what happened to the Virginia Estates?"

"They were colonized by the British, just as they seem to be here, only right up to the Canadian border." Anthony indicated on the map. "Then the British won the French colonies, and after the American Revolution they became the United States."

Again there was a kind of breathless

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pause. Then Stanger said, "The American Revolution! Do you mean that people revolted against a legitimate King?"

"Yes. Don't they sometimes? The French did, didn't they?"

Stanger said firmly, "Never! No one would think of anything so outrageous. It would destroy all the security of society. It's been advocated on philosophical grounds, but I doubt if any thinking person takes the idea as more than a kind of political joke. Tell me something, old man. If you are opposed to the King in this United States of yours, how can you conduct a government?"

Anthony said: "Oh, we have something called democracy. We elect—"

Hausleiter said, "Democracy . . . a word of Greek roots. Government by the mob. Of course it cannot mean exactly that; it would be unworkable."

"Well, now look here," said Anthony. "You'd find a lot of things were workable if you tried them. For that matter, if you think so highly of being ruled by a king, how does it happen you only have a duke?"

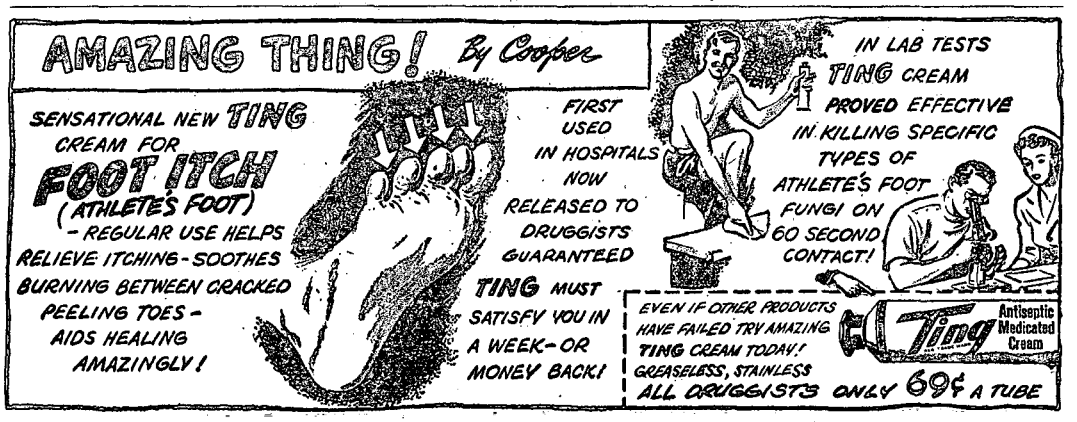
Stanger said, "That was the result of historical process. After Norrland won the Colonial War, one of the peace terms provided that Manhattan should become a free city, having commercial relations both with Norrland and the crown colonies. Most of us would rather be back under King Owen, but that doesn't affect the merchants and shipping men. They're making too good a thing out of it. And they control the Chamber of Nobles." He made a face. "Now—"

"Now," said Anthony, "If you'll excuse me. we seem to be getting down to details that we could settle another time. I've just been through a rather harrowing experience and I'm frightfully hungry. Can't we postpone the remainder of this until another date?"

VII

THE Manhattan of this time-stream moved at a slightly slower pace and had just entered on its period of skyscraper building. There seemed to be about as many people in the streets, but they looked different and were dressed differently, the men better, the women more carelessly on the whole. Central Park was not Central Park, but Duchess Margarethe Park, with a statue of an amiable and well-upholstered lady facing the west side entrance opposite La Guardia College, which was not La Guardia, but Commoners' University. Cigarettes had not been invented, but the cigars were good and both men and women smoked pipes. The money was a bewildering variety of Virginia Estates pounds, shillings and pence, Norrland kroner and a Manhattan coin called a "dixie," bearing the ruler's face and the figure 10. The current King of Norrland was called Olaf the Haughty and was the subject of bad jokes.

[Turn page]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This much Anthony learned over dinner and at a subsequent briefing session that lasted until he pleaded weariness. They were quite agreed on the reentrant time circuit, on the quite indubitable fact that some persons existed on this return, even with the same names and the same general characteristics, while a few did not appear to have been reproduced at all, like Babe Ruth, Lincoln and Howie Schwartz, who used to run the news stand at the corner of 82nd. (The streets had names and not numbers.) But the most vital question Anthony hadn't even dared put into words for the three professors.

What about Barbara?

At the moment, the answer to the question was considerably more important than getting hold of a history book and informing himself a little about the subject he was supposed to be teaching. In his own room, which was, like everything else an almost—but not quite—duplicate of the one he remembered from his own time-circuit, he turned a trifle regretfully from the bookcase and located the telephone in a little wall-cabinet of its own, with the directory beside it. The McGoverns were listed all right. His heart was beating a trifle as he dialed.

The voice that said, "Good evening," didn't quite sound like Barbara's.

He hesitated a moment and said, "Is Barbara there?"

"This is the Countess Barbara."

He experienced a sense of shock. "This is Bob—Anthony."

"Oh." The tone seemed startled.

He plunged ahead desperately. "Listen, I know it's late, but something's happened, and I simply have to see you right away. Can you meet me at the—Duchess Margarethe statute?"

"Oh, I really shouldn't. Mother—"

"This is important. As important as anything that's ever happened. Please, Babs."

Her voice was very low. "All right. But give me about ten minutes to think of a good excuse."

She hung up abruptly, without giving him a chance to find out why she needed an excuse. He rummaged out a pipe and lit it, reflecting that here, as in the Arthurian age, unconscious memory, coming in bits and flashes, was a help, if like peripheral vision, one didn't try to push it too hard. The clock said 11:45. He gave it five minutes instead of ten before putting the pipe away and starting down the stairs.

SEEN at night, Central Park was more orderly than on his time-circuit, and with taller trees. A blonde girl with hair down her back came down the street, paused as he took up his post in front of the statue, and said, "Want to go for a walk in the park?" and looked disappointed when he shook his head. Two policemen went past; he noticed their blue uniforms were piped in orange.

Then she came. It was Barbara all right, holding out both hands to take both his, and looking strangely agitated. He said, "Let's go in the park and find a place where we can talk. I have a lot to talk about."

She looked up at him, and it seemed there was a shadow of trouble in her eyes. "Why—all right, if you really want to."

He took her arm and led the way down one of the curving paths, around a turn and to a bench where light filtered through leaves, then sat down and took both her hands.

"Babs!" he said. "What's the matter? Is something wrong?"

"I—I—simply mustn't be seeing you like this."

"Why not? You're free, white and twenty-one."

From somewhere a voice bellowed, "No you don't!" and there was the sound of a scream.

Barbara put her head a little to one side and said, "No. Not as free as one of them is. People in the Orders never are. This time—it's all right, but it will have to be the last time. And even so, if Baron George finds out—"

"Who is Baron George?" A man

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named George Shepherd has been Mrs. McGovern's favorite candidate for Barbara in that other world. A girl went past, pausing to give Barbara a slow appraising glance, before she could reply.

"As though you didn't know. Baron George Catoctin, the man I'm going to have to marry."

Anthony said, a trifle grimly, "No, I didn't know. And you're not going to have to marry anyone but me. Listen, and I'll tell you why. I'm really from another age, and I think a freer and better one."

He sketched the outline of his story and something about the New York he had come from. When he had finished, she sat very still with her hands in her lap, and said, "Oh."

"Signifying what?"

"I knew about the temporal adjustor. In fact, Professor Aaronson was explaining it to me in my science course. But I didn't think you could alter the past that much, or physically."

Anthony said, "I don't think even the people who built it know quite the results on a plunge as deep into the past as I took. Anyway, I came back still in love with you."

In a small voice Barbara said, "And I with you. Otherwise I wouldn't have come to a place like this."

"What do you mean?"

"You didn't know? The Duchess' park is the place where—where—girls bring their men, and when you asked me to meet you here, I thought it was to . . . ."

He swept her into his arms and kissed her. "And came anyway, to be with me! Darling, I apologize for putting you on the spot, but I'm glad I did it. Now we know we love each other; why can't we just get married and damn the consequences?"

She pulled away slightly. "You forget just one little detail. You're a commoner, and I'm the Countess Barbara."

HE SAID, "Is it as strict as that? I didn't know; my memory is only good on little things, like where to buy a newspaper or find a handkerchief."

She said, "It's as strict as that. You'd be dismissed from your post and the marriage would be annulled."

"Couldn't we go away to the Virginia Estates?"

"Baron George is a Virginia baron. It would be even worse. You see—" she put one small hand on his— "nobody minds—too much—if I come to the park with you, or something like that. But with a marriage it's different. You'd have to be ennobled and Duke Bernd hasn't made any new nobles in years; and besides, I've already been askd by a noble, and I can't let mother down."

The Social Register. He said desperately, "Couldn't we go away to Norrland, anywhere?"

"Be practical, darling. How would we live? You couldn't teach history you don't know anything about besides not knowing the language and being a foreigner. But if you want me, here and now . . . ."

She didn't finish the sentence. The thought flashed through his mind that the real Arthurian moral system was a good deal different than that described by Tennyson, and it seemed to have stuck. But that didn't matter now. The only thing that mattered was that she was here beside him. With the blood beating in his veins he reached for her—

"I thought that would be it," said a voice in tones of biting sarcasm.

Anthony looked up to see a tall man in a kilt of a poisonous green standing over him, and recognized George Shepherd. A few paces behind him was one of the policemen. He got up from the bench and Barbara imitated him.

She looked defiantly at the Baron George. "Well?" she said.

"Well enough for you, no doubt," said the Baron, "but it remains to be seen how well things will be for this character making you into a common tramp."

Anthony didn't even think. The straight left he threw was one of the best

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he ever put out; it caught the Baron George squarely on the point, he went down like a ninepin and lay there with one foot twitching slightly.

The next minute Anthony felt himself grabbed by the policeman. "It's all right, officer," he said. "I'm not going to hit him again—unless he asks for it."

"You damn well better not hit him again," said the policeman. "Are you off your nut? Can't you see he's wearing a kilt?"

"He's wearing shoes, too," said Anthony. "What difference does that make?"

"Say," said the policeman, "are you really nuts?"

Barbara said, "I am the Countess Barbara McGovern, officer. My friend here was a good deal disturbed and didn't quite realize what he was doing. Can't this be straightened out somehow?"

"Well—" began the officer, but was interrupted by a voice that said, "No, it can't."

They turned to see the Baron George dragging himself to his feet with one hand to his mouth, which appeared to be giving him trouble. "No, it can't," he repeated. "He could see perfectly clearly that I was wearing a kilt, and knew I was noble. It's a straight case of *lése majesté*, and you were a witness. If you don't arrest him I'll make a charge against you."

The policeman's face hardened. "Too many of you guys are too smart," he said, and then to Anthony, "All right, I guess I'll have to take you in." He produced a notebook and turned to the Baron. "May I have your name and status, sir?"

VIII

THE warden said, "You got company, nutsy," and swung open the door.

It was Barbara, in a wide, long swishy black dress with elaborate frills all down the front and a wide black hat that swept down over one eye, looking as though she had just come from a garden party, but one where all the guests were in mourning. She had on elbow-length black gloves.

Anthony stood up. He said, "I'm afraid there isn't much seating accommodation in this place. Will you take the bed?"

The warden's grin was practically a leer. "When you get ready to leave, your ladyship, get him to bang on the door, will you? Sorry I gotta lock you in. Regulations." He banged the door, and they heard his feet going down the corridor. Anthony seized her and kissed her, but after one responsive contact she pushed him away, saying, "We haven't much time."

"What do you mean?"

"You've got to escape; get out of here."

"The lawyer they sent down from the university said it wasn't very serious; only a second degree charge."

She gave a little throaty bark, an unfunny laugh. "I know. Twenty or thirty days and perhaps a fine. But that isn't all. At the end of your term, you'll have to kneel in public and make an apology to him. And I don't think you'll do it."

He felt himself frowning. "What if I don't?"

"Another ten days and then the apology again. And so on. After the fourth or fifth refusal, I don't know, they'll banish you as a socially indigestible—to one of the French Imperial colonies in Africa, probably. They can always use serfs in the uranium mines. Remember, I've been on the other side of this as a noble."

"How horrible." He saw it in a flash—the concealed system of thought control, yet probably no more drastic or philosophically worse than some of the systems of enforcing orthodoxy in what he thought of as his own time.

Barbara ever practical, said, "I don't agree with you completely, but I love you, and the thing to do is get you out of here before it starts."

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"But where can I go? Back to the university? Would they—?"

"No they wouldn't. I've been thinking about it until my head is nearly broken, all night, and all day today. After what happened—there in the park—I wouldn't marry him if the sky fell."

Anthony felt a surge of intense, pure joy through every muscle. He leaned over and kissed her under the floppy hat. "You're going to try running away with me somewhere?"

"Yes, but—" Suddenly she leaned over and sobbed a little. He forebore to do more than put one hand on her shoulder until she extracted a handkerchief from a bag as big as a briefcase and dabbed at her eyes. "I'm sorry," she said. "I've thought and thought about it, and we haven't any money, and it's just impossible to escape in space. The only chance is to escape in time, and I'm afraid I'm going to lose you."

"You mean the tempolator—the temporal adjustor?"

"Yes. I can operate it. We nobles have to learn something about a science or an art or lose our status, and I took nuclear physics under Dr. Aaronson, don't you remember? So I want you to change a past somewhere so that it will change the present to one we can have a chance in."

ANTHONY felt a thrill such as he had not experienced since he saw the evil eyes of Mordred watching him through the helmet-slit. He said, "I'm not sure—"

"Are you afraid? I've worked it all out. We'll have to wait till night, but I know a place you can hide till then, and we can get into the laboratory. They don't lock it, and even if the watchman objects, I'm a noblewoman, and he'll have to let me in."

"That isn't it," said Anthony. "I'll try anything with you and for you, darling, but the conditions are—constricting. You see, I went so deep last time, back to Arthurian Britain. I don't know the history of this time-circuit except before that, so there wouldn't be any use sending me back to a later phase because I either couldn't get there or couldn't do anything. And there aren't so many major historical decisions before that that a single man could influence."

"You're wasting time," said Barbara. "I tipped the warden, and he thinks he knows all about this visit, but he won't give us forever."

"Dearest," said Anthony, "I'm trying to find a grain of certitude in an uncertain world . . . let's see—Constantine taking up Christianity, no that's not a decision you can honestly be doubtful about, and we don't know enough about the machine to dare try without that feature. Caesar—no, I couldn't do it . . . wait, I have it! Diocletian split up the Empire into administrative districts, and almost saved it, but the method of succession he worked out was all wrong and ruined everything. That will be it."

"I wouldn't know," said Barbara, "but I'm glad you've made up your mind. Turn your back and take off everything but your underwear."

He turned obediently and began to peel out of the tunic-jacket, but said, "Why?"

"You and I are going to change clothes. Why do you think I wore this ridiculous borrowed outfit? They don't dare hold me; helping a *lése majesté* prisoner escape isn't a crime for a noble. It's all right."

He was so willing to believe it that he did. The dress and some garment that apparently went under it came over his shoulder, he passed his own clothes back and struggled with unfamiliar fastenings.

After a minute Barbara said, "All right, I'm decent," and as he turned around, "Let me look at you. It doesn't matter too much how I look in this cell. Oh, dear! You'll have to get that ruffle line straighter than that."

She fussed with him, arranging. The ruffles in front were a definite help in concealing the lack of femininity. After a minute she stood off and surveyed him.

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"That ought to do," she said, "If you'll remember to swing your hips a little when you walk. Now here—"

SHE bent to the out-size bag, produced a swatch of artificial hair, adjusted it to his head, and then set the hat on his head. "It isn't perfect," she said, "but I think it will do all right if you keep your head down so that the first thing anyone notices is the long hair. When a person catches a detail like that, he automatically completes the picture in the way he expects."

He said, "I can't very well go back to my apartment, especially in this. It's in the bachelor quarters building, you know."

"I thought of that," said Barbara. "Take a taxi. You're to go to 315 Haarlem Street—that's only a few blocks from the university—and look for Graf Nystrom. His name will be on one of the bells. He's a Norrland nobleman for whom I've done some favors at one time or another, and he will be glad to let you stay there until it's time to meet me at the laboratory. Let's see—I don't think we ought to make it much before midnight; there might be someone working late, and besides, if you wait, it will take them that much longer to find the taxi that carried you."

Anthony lifted the edge of the floppy hat, reached over and kissed her. "I think this is going to be worth the trouble, darling," he said.

She wriggled from his arm. "And be careful about the voice," she said. "If you keep it low and rather husky, they won't be able to tell. Now give me some of the money out of the bag, I suppose they took all yours away when they put you in here, and then bang on the door for the warden."

The man was whistling in a manner clearly intended to be meaningful as he led the way down the corridor to the door, and Anthony was tempted to venture a rebuke of some kind, but decided he didn't quite dare. Outside the streets were panting under the impact of a hot June; the first taxi in line had an "Occupied" sign out, and Anthony had to go down to the second, trying to make his walk as much like Barbara's as possible, and hoping it wouldn't give him away. He got in and said, "Three-fifteen Haarlem" in a low voice.

The cab swung through streets that had considerably fewer three-dimensional moving signs overlooking the street than in the New York he knew, and pulled up in front of a mansion with an incongurous castle-like appearance. There were only three bells at the top of the steps, one of which said "Nystrom," with a coronet over it. Anthony pressed; the door came open and he was in a hall, at the end of which another door came open on a bowing servant, and Anthony followed through to find himself in a large living room with furniture of light-colored wood, facing a tall, white-haired man with a craggy face.

"You are the Mr. Professor Anthony?" he said. He didn't offer his hand. "I am Graf Nystrom."

Anthony said, "Yes. The Countess Barbara—"

"I know." Nystrom surveyed him. "I am glad to be doing for her. I think one of Erik's suits befit you. Erik!"

The man who had opened the door came in again. "One of your street suits, not livery please. It will be returned to you." He swung to Anthony, "You are to use the room through that door."

"Thank you," said Anthony. "I can't tell you how grateful—"

"It is nothing. On the table, you find a bottle of schnapps, the which you are needing. It keeps the courage up, no?"

Anthony had just slipped free from the restrictions of the dress when he heard the bell in the apartment ring again, long and loud. There were a few moments of pause, then through the crack in the door he heard, "I am Graf Nystrom. Did you wish to see me?"

A remembered voice said, "I am George, Baron Catoctin, and if you want to know, I don't wish to see you at all. I came for Countess Barbara McGovern, who is in here—in your bedroom." The last words were a sneer.

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"Here is no Countess Barbara," said Nystrom slowly. I am yust a Norrland nobleman, and this is my home which I ask you to leave."

Baron George's voice went up in pitch. "I know damn well you're one of those Norrland squareheads. And I know damn well how you're going to look when I give this story to the papers. You'll be lucky if that King of yours doesn't recall you in twenty-four hours for morals violation with a Manhattan noblewoman. But keep the wench; I'm through with her."

"One moment," came Nystrom's voice. "No, Erik, do not open the door. You are not giving any informations to the newspapers, Baron George. You are not, because although as you say, we Norrlanders are very squarehead, we also have eyes in our heads, and I do not think it will be too good for you, Baron George, if it became known some of the things you are doing, such as trying to bribe the Chamber of Nobles to make a new succession law that will allow a Virginian to become duke of Manhattan."

"I didn't—" began Baron George, but Nystrom cut him off with, "Karl! Now you will help Erik tie this person up and place him in the second bedroom until our guest has left. He is wrong about it, but I know how he does things, and he would be quite glad to call up the papers and have photographers here when our guest left. And that would not do, either."

IX

"I'M NOT SURE I can manage the sphygmomanometer," said Barbara. She was still wearing Anthony's clothes, with her hair oddly piled and twisted, and he thought it made her look beautiful.

"It doesn't matter," he said. "The thing's such a frightful gamble anyway—for both of us."

She said, "Do you know, I've begun to doubt that? I think that whatever alterations take place in the time-circuit, there'll still be a you and I, and we may have our difficulties, but we were ultimately meant for each other."

"I hope so," said Anthony. "The only thing—"

"What?"

"Well, it's still chancy in two ways I can see. Suppose someone else has one of these devices, and turns up in competition with me, with an entirely different program? Or suppose I turn out in some position where I can't influence anything? A slave, perhaps."

She said, "I don't think there's too much danger of that. You hit approximately the status in King Arthur's day that you had before, didn't you? And almost exactly the same when you came back here." She was testing circuits and talking over her shoulder.

"I know, but my status as a historiographer didn't do me much good. I couldn't recall the immediate detail that would have been useful."

"Doesn't matter. We're dealing with a practical condition. There: it's set."

"On Rome, I hope? Diocletian did a lot of traveling around, but still that was the center of things, and the best operating base."

"On Rome." She put out her arms to be kissed, he climbed into the chair and for the second time the blackout began. . . .

HE WAS lying on a dining-couch, looking across the atrium. A quick glance down showed he was in military garb, not a toga. Good, that meant he was an official, and probably of some rank.

A voice said, "What do you think, Antoniades?"

Unconscious memory hadn't had time to give him any briefing. He sparred for time with, "What year do you think this is, anyway?"

The owner of the voice—Anthony spotted him as the smooth-shaven senator on the next bench and knew him as Orosius Lantentius—said, "Why the year A.U.C. 1045. What would it be?"

Doing furious mental arithmetic with the back of his mind to convert to more

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familiar terms, Anthony said, "I thought it might have been the time of the Public Wars. How anyone could make such a remark in A.U.C. 1045 puzzles me." That ought to be safe.

There was a burst of laughter from across the table, and Anthony looked past the flowers and flagons to see something that made him stiffen. The opposite bench was occupied by a dead ringer for George Shepherd, or the Baron George Catoctin, and next to him with her head in his lap, apparently enjoying herself thoroughly was—Barbara.

The shock was so violent that he could only stare, without being able to orient himself for a moment. He reached for a flagon, and as he did so, realized that he didn't have much to kick about. There was a head in his own lap, a head of smooth black hair, attached to which was a system of curves not left to the imagination by the silk garment. Her name would be Laelia.

Before he could think of anything else the beautiful woman with the straight patrician nose and gold fillet around her hair at the end of the table said, "And do you think, Antoniades, that the ancient Catonian virtues have departed from modern Rome?"

She must be Valeria Diocletiana, the Emperor's daughter. "I did not say that, Augusta," he said, putting respect into his tone. "It merely seemed to me his thinking belonged to another age."

"One in which not even the *castrensis sacri palatii* would be allowed to bring his slave mistress to a formal banquet," said Senator Lantentius, with an unpleasant smile.

With another shock, Anthony realized that this meant him, and also that he was, after all, in a Rome where morality was a good deal different than in his own time. Valeria saved him from replying by saying, "You are too cruel, Lantentius. We all know of the hopeless passion Antoniades cherishes for Ausonia Berenice—" that was the name of the Barbara across the way!—"and you would have him sit glowering and spreading gloom at our feast. Hypsiste forbid! Under the Augustus, we are all one."

The Baron George lifted his head. His name was Anfidius Cappodolaris, Anthony recalled now. "Oh, I withdraw my claims in his favor," he said, "If I ever had any."

Ausonia Berenice said, "It is not who has claims on me, but to whom I am given." She even had Barbara's voice. Anthony speculated furiously on the meaning of this duplication; was it imagination, or was there some kind of time-potential in the machine? Or what did it mean.

VALARIA carried the ball again. "There's ancient Roman virtue for you! But you have a father with no imperial obligations, who does not have to practice the virtues at the expense of your feelings. I am sure he will give you to a husband worthy of you."

A grave man farther down the table, whom Anthony recognized as the Senator Celsius said, "Yet the arrangement is most sound for the restoration and stability of the empire. While each of the two emperors is supported by a Caesar who is married to his daughter, there can be no question of the legions proclaiming a rival, as in the bad old days."

Senator Lantentius said, "And the succession is secured to the best men. I had an express from the Caesar Constantius; Maximian has turned the recovery of Britain over to him, and it could not be in better hands."

Anthony knew where he was now. This was 291 A.D. of his time, and Diocletian had just made his famous four emperor arrangement, with Maximian in charge of the west and Constantius Chorus under him, while he himself ruled the east with Galerius as his Caesar. Each Caesar was to marry his Emperor's daughter, and be recognized as crown prince. There was something wrong with the way the arrangement had turned out; something that lay hidden under the shimmering veil of the immediate future which his mind could not penetrate. The

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assemblage of curves at his lap stirred and reached for a bunch of grapes. She was certainly a nice little dish.

Valeria was saying, "In high politics I am not experienced, and it is likely you are right. But this I know, Galerius has a wife whom he will have to divorce to marry me, and I believe he loves her. It is ill to sleep in another woman's bed. And besides, he smells of horse."

Anthony said, "There might be a way to avoid this marriage."

"By unfavorable sacrifices?" Lantentius laughed. "Now it is you who are in the time of the Punic wars."

"Let the man speak," said Anfidius from beside Barbara-Berenice. "As *castrensis sacri palatii,* he has the records and knows the precedents."

Valeria said, "No, let him not speak. We are met here for pleasure rather than the burden of affairs. Vulpius, as master of the revels, will you propose another round of wine? The richer mixture."

The man beside her had almost too-handsome features and a wreath around his head. As he said, "Let it be so," it occurred to Anthony that there might be another reason beside Galerius' present wife and horsey smell why the Emperior's daughter didn't want to marry the Caesar. But he was certain of a couple of things. One was that in spite of Diocletian's prodigious administrative reforms, the reorganization of the whole empire into easily run units, and the military ability of all four members of the imperial college, this system of marriages was not going to work. It never had as far back in the history of Rome as he could remember. It might secure the peaceful succession of Constantius to Maximian and Galerius to Diocletian, but when the two Caesars became full emperors there was no guarantee that they would choose good Caesars in turn.

The other thing he was sure of was that more than anything else he wanted Barbara-Berenice.

The nice little dish was no real substitute. . . .

ANTHONY woke with a start at the touch on his shoulder. The bearded face of his Gothic night guard was grinning at him from beside a Greek lamp, and beside him stood one of the imperial pages, a small lad with a peaked, anxious face. "Summons from the Augusta," said the guard, and said it in a tone that indicated he thought he knew what a summons at this hour meant. And even rumor could be dangerous in a place like this.

"Accompany me, Rincimer," said Anthony, shortly, bending over to tie his sandals.

The page led the way through corridors singularly empty at this hour of night, whatever hour of night it was. Anthony felt heavy and sleepy, and his head ached slightly as a result of the wine. The Goth, who was pretty quick-witted for a barbarian, didn't say anything, but strode along behind, his sword-chain clanking. The page led the way around a couple of corners to the door of the room in the west wing known as the room of the Decii, tapped, and opened the door.

Valeria Augusta was sitting in an X-shaped chair with curved arms beside a table on which there was a single lamp. There were book-scrolls on another table, and the night breeze through the window was cool. Hangings covered two walls of the room.

The princess lifted her head and said to the other two, "Leave us!"

There wasn't any place to sit down. Anthony remained standing and wondering what this was all about until the door closed behind the pair. Valeria said, "Approach, Antoniades. I wish to continue our conversation."

"Which conversation, Augusta?" he said.

"The one at the dinner-table tonight, when you said there might be a way of preventing this marriage in which I have no heart. At the table there were too many ears, including those of some who would be quick to counterbalance any plan you named."

"I see," he said.

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"Now I would ask you—have you some precedent in mind against which there would be no appeal, like that which forbids the king of the sacrifices to ride in a car?" She gestured toward the scrolls. "I have been searching the books but I find none."

Anthony said, "No, it wasn't exactly that."

"Then what is your plan? I cannot myself refuse or run away, and I would not if I could. It would be contrary to the genius of the Roman people."

Anthony hesitated. Then he said, "I don't know that it was anything as specific as a definite plan. But I hoped that if I laid certain representations before the Emperor. . . ."

She gave a short laugh. "You! . . . but wait! He does trust you, or he would not have placed you in charge of the pages and records. And he knows you to be deeply read in the philosophies and history. What would you represent to him?"

"That he has solved all but one problem. Though divine, he is not immortal. And who comes after him?"

"Galerius in the east, and in the west Constantius after Maximian."

"Good so far," said Anthony, "and who after them?"

"Constantius has a son. I might bear children to Galerius."

"That is precisely the trouble. The empire will not stand in such a case."

She stirred a little, and Anthony, feeling uncomfortable standing, shifted his feet. Then Augusta said, "I am my father. Convince me!"

She looked like it, too; the same strong, imperious face, almost un-womanlike.

Anthony said, "It will fail. The task is too great for anyone not trained to the purple rather than born in it."

VALERIA had a thoughtful frown. "But this is why Constantius and Galerius were made Caesars. You are a starling in statecraft."

"That I admit. I am an observer and keeper of records. But from the records of the past, one can learn much about the present, and even the future. And here the records show that whenever son has followed father to the purple, there have been troubles and disasters: after Septimius Severus, Caracalla and Creta; after Marcus Aurelius, Commodus; after Carus, Carinus and Numerian."

She said, "Son follows father in Armenia and Persia."

"Rome is not an eastern country, and not a unit, as they are. She needs the services of a trained administrator, and a system that will bring forward another when he is gone. Tell me, was Rome ever better than when Trajan, Hadrian, Antonius Pius and Marcus Aurelius succeeded each other?"

"You argue divinely, Sir Castrensis. But what else has my father done than what you say? He has chosen Galerius as his successor."

"Ah, but he has made it a family matter, and moreover has set up a second imperial family in the west. The two cannot fail to come to blows. There should be one emperor only, one head, with all the rest his deputies, and no matter of family involved."

"Maximian is already an Augustus."

"Then let the divine Diocletian take a new title which will put him clearly in the first place."

She was silent for a moment, her chin on her hand, thinking. Outside, somewhere in the street below, a dog fell on a paroxysm of barking, then broke off abruptly. Anthony moved his feet. It was very dark below in the city.

Valeria said, "This seems to me a very reasonable thing that you propose, and if my father agrees, I shall certainly be delivered from Galerius. You shall go to the Augustus with your representation. But in order to make sure that you use all your eloquence in supporting it, there is a reward. I will use whatever influence I possess with Claudius Ausonius to persuade him to give you Ausonia Berenice."

Anthony felt, rather than knew, that this was the cue for him to fall on his knees in gratitude, so he did it. Valeria

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raised a warning finger. "There is a condition. I no more wish Berenice caught in a forced marriage than I wish to be in one myself. You must obtain her permission and good will. You have mine." She stood up. "You are now permitted to leave."

OUTSIDE, Rincimer was leaning against the wall of the corridor and yawning prodigiously. The page had disappeared. Anthony moved through the corridors, thinking furiously. The thing he did not know was how he stood with the Barbara—or Berenice—of this age and time-circuit. He was too close, too emotionally involved for unconscious-memory to be of any service. She might not like him. She might be simply uninterested. And Valeria's offer of assistance. . . .

"Master," said the Goth behind him.

"What is it?"

"I thought you ought to know; after you left the room of the Decii, someone came out and ran in the opposite direction. A page, I think. He was small."

There hadn't been anyone but Valeria in the room. No, wait, those wall curtains. There could have been someone hiding behind them. But if he had been hiding there, then not by Valeria's order, because she would have taken the hider with her, not left him to run in the opposite direction. Therefore, someone was spying, but it would hardly do to let the Goth know he was disturbed by the knowledge. Anthony said, "I will examine the pages in the morning. It was right you told me."

As he turned in at the door of his own sleeping-chamber, another page was just inside, sitting on the floor against the wall, with his knees drawn up, in the dark. He scrambled to his feet as the light from the lamp struck his eyes and made an obeisance.

"Lord Antoniades," he said, "Laelia asks whether she may come to you tonight."

"Tell her not tonight," said Anthony.

Outside the window it was just breaking day. . . .

X

ANTHONY sat in his office, looking toward the Circus Maximus, and dealt with the morning's business. A new consignment of linen had just arrived from Gaul; would he examine a sample and see whether the imperial palace cared to exercise its right of first purchase? The secretary reminded him that the last batch of parchment had been extremely poor; there would have to be a letter about that. A page named Faustinus had knifed another; the Prefect of the Pages had already judged the criminal and ordered him fed to the beasts in the arena, but the judgment would have to be confirmed. The Emperor had scattered and destroyed the forces of the rebel Busyris in the Thebaid; the dispatch had to be properly digested and rewritten for entry in the records. And so on. He was just deciding that there were so many details on which unconscious memory was incompletely helpful that he had better make his noon meal on bread and onions in the office when a slave pushed past the door-guards and handed him a set of tablets.

The seal was not one he knew. Anthony frowned at it, broke it, and read:

"She who offered you a service for a service renders part of hers. If you would learn how high your hopes may run, be in the court of the cypress at noon."

Valeria! In the eternal atmosphere of intrigue that surrounded and ran through the court, this was probably as much as she dared say, even without her signature and under a seal that was not her own. He erased the tablet, called Statilior, the prefect of the pages, told him to handle anything that came up on a basis of obtaining subsequent approval, and set off for the court of the cypress with a beating heart. It was far over on the other side of the palace and noon was nearly, if not quite, upon him.

The court was surrounded by a low colonnade, a pleasant place where rows of black cypress surrounded marble walks and beds of flowers, with benches beside a fountain that played in the cen-

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ter. There was no one there but the slave who saluted him at the door.

Anthony sat down and began to resume his thoughts at the point where the Goth's interruption had broken them the night before. What were Berenice's relations with Anfidius, who now that he got the peripheral vision of his mind on it, he recognized as the *praepositus,* or Grand Chamberlain? If the analogy of the other time-circuits held true and he was somehow identical with George Shepherd and the Baron George, he would have the inside track with Berenice's parents. And the Grand Chamberlain was a very big pot indeed. On the other hand it was dangerous to argue from analogy. The Free City of Manhattan had almost, but not quite, reproduced his own New York, and with differences almost as important as the identities.

Berenice stood beside him.

He jumped up, holding out his hands. She took one of them, a cool, firm grasp, and said, "The Augusta said that there would be someone here for me with a message. I didn't know it would be you."

"Will you sit down? The message is not altogether brief."

She sat, gracefully. A slave came through the door into the court with goblets and a flagon of wine cooled with snow, set it down and scuttled back again as though pursued.

Anthony searched for words, and couldn't seem to find the right ones. Finally he said: "Perhaps the message is brief, after all—I love you—there it is."

She looked him straight in the eyes, and without stirring, said, "Well, then, I have a mesage for you. I love you, too."

The next moment they were wrapped in each other's arms.

WHEN they were a little quieter and had poured some of the wine, Anthony said, "Valeria-Augusta wants me to do her a service. She said that if I succeeded, she would use her influence with your father to give you to me."

Barbara-Berenice frowned. "I am not sure that will be enough," she said. "After all, we are *spectabili,* and you are only a *clarissimus.* No, I love you and it cannot be taken from me, but we can't marry."

"Why not?"

"Let us be practical, my love. My father is a senator, but we have no money, no money at all, and the estate in Picenum is mortgaged to the hilt. I must make an important marriage."

A suspicion flashed in Anthony's mind. "To Anfidius Cappodolaris?" he said.

She laughed. "Oh, no! He would have me willingly, but not in marriage. And last night he hinted that there was some higher plan for me. I don't know what it is, but he holds long discussions with my father."

An idea struck Anthony. He said anxiously, "I hope it isn't a plot."

"I am sure not. I know my father well enough to be certain that he is loyal to the divine Emperors, and I'm sure Anfidius is, too. No, it is a plan rather than a plot, for advancement within the regime. But it involves the man my father chooses for me."

"Why couldn't he choose me? With Valeria's help—"

"No. That isn't part of the plan. They are looking higher." She laid a hand on one of his. "But marriage isn't the end of the world. After I am married, you shall be my lover."

He had forgotten that this was pagan Rome, but he gripped her again, and through the long kiss said, "Why not now?"

She returned the embrace, but said, "It might spoil everything—"

Practical Bar—Berenice. He said, "I'm going to keep after you, anyway."

"Do all you can. You have my utmost love and good will." She shook herself free. "And now I must go."

"When can I see you again?" asked Anthony.

"After I'm married. Except when we meet in public, as such a rendezvous as this is too dangerous, even with the Augusta's help and in the palace. There are too many slaves to earn favor by

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carrying a tale." She got up and they embraced once more, standing, before she fled like a fawn for the shelter of the colonnade.

ALL THE WAY back to the office, he puzzled on the mystery of Anfidius and his plan, and while he was about it on the parallel question of what he was supposed to accomplish or prevent in this time-circuit. If his experience at King Arthur's court were any criterion, he could probably count on impulse or unconscious memory to supply the drive in the right direction; but he wasn't sure about the criteria, the parallels weren't precise. The presence of duplicates for Barbara and George Shepherd, in quite a different relationship to each other and himself than in his native time-scheme, proved that. And the thing he wanted most to do was marry Barbara, in whatever condition he found himself, which quite clearly couldn't be his mission.

Statilior was pacing the corridor nervously as he approached the door of the office. He hurried up to Anthony, spreading his hands. "You have been late!" he said. "If I had only known where to find you! The Praepositus himself wished to see you, but he has gone."

"I'm sorry, but don't take on so about it. It probably isn't that serious."

Statilior wrung his hands. He was an active little man. "But, oh, the lost opportunity! After his opposition to you! What a chance for a reconciliation! What you could accomplish together! He left tablets."

Anthony made his way to his chair of state and sat down. "Get them for me." Peripheral memory added another bit to the puzzle; Anfidius was jealous of Anthony's semi-independent position in the management of the court, and quite willing to knife him in any way possible. The duty-slave approached with the tablets on a salver, knelt and offered them. Anthony broke the seal.

"From the Praepositus Lucius Anfidius Cappodolaris to the Castrensis Regulus Antoniades: Greetings," he read. "If you are well, I am also well. If you were in earnest as to the project spoken of at last night's banquet, it might be that much help would be given where little was expected. An officer of the empire will know that the army which moves most swiftly gains the greatest victories; and that right wing and left wing should act in common."

It occurred to Anthony that the tree of his remark about preventing the marriage of Galerius and Valeria—for this must be what was meant—was bearing an unusually large amount of fruit. He said to Statilior, "You'll have to carry on here for a little while longer. I'm going to see Anfidius."

"I will have your litter called."

Of course. When one court officer went to call on another, it would have to be in the most formal style, even though both were in the precincts of the palace.

The litter wasn't very comfortable, but the trip wasn't very long, either. Anfidius was seated behind a table, going over a scroll when Anthony came in. He rose in greeting, smiled, indicated a seat near his own, and motioned the two slaves to be gone. Not until they had left the room did he lean forward and speak.

"My dear castrensis," he said, "You and I have had our difficulties in the past, but I think we are both loyal servants of the empire—servants of the empire." He repeated the last phrase, blowing out his cheeks a little, as though it gave him particular satisfaction.

EVEN IN THIS new guise and speaking words of friendliness, Anthony couldn't bring himself to like the man. There was something off-color about him, as though the things he wanted were never quite those that could be attained by any honest means. So Anthony merely said, "I hope so," and waited.

Anfidius said, "Even the Emperor cannot always do the best thing for the empire when he first considers a problem, is it not so? That is why he has us, his loyal servants."

"I dare say," said Anthony.

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"You are making it difficult for me to be confidential with you. But I will be frank. From something you said I received the impression that you agreed with the Augusta Valeria, and were willing to help prevent her marriage to the Caesar Galerius if it could be done."

"Well—yes," said Anthony. "If it could be done without causing trouble."

"I see—I see. May I inquire the means?"

Anthony thought a moment. There was no particular reason why he should hold out; he was going to offer a line of argument rather than an intrigue. So he launched into the explanation he had given Valeria.

When he had finished, Anfidius leaned back in his seat and puffed his cheeks out two or three times. "Most ingenious," he said. "Perhaps even convincing to a man of the divine Diocletian's type. Yes. Yes. But I fear there are reasons of statesmanship why such a reorganization of the imperial offices as you propose should not be carried out."

"What are they?"

Anfidius waved a hand. "Matters of policy. I cannot tell you everything at present; you will understand."

"But if you think Valeria shouldn't marry Galerius, how are you going to prevent it?"

"By having him marry someone else!"

"Perhaps we can co-operate after all. But I thought he already had a wife, and was in love with her."

Anfidius smiled. "So the Augusta remarked. Her information is not quite up to date. The Caesar Galerius has already divorced his previous wife in preparation for a new marriage. My branch of the imperial organization has an excellent courier service."

"But what makes you think Galerius would want to marry someone beside the Emperor's daughter?"

"Because he is a soldier and a particularly passionate man. I propose to offer him an irresistibly luscious morsel, and moreover one of senatorial rank, who will advance his prospects of becoming Augustus."

With fear gripping at his heart that he knew the answer, Anthony said, "Do you have a candidate selected?"

Andifius smiled again. "Surely you must be aware that I mean Ausonia Berenice. If our mutual project is to succeed, you will have to be cautious."

XI

HE WAS both nervously and physically exhausted, and it was certainly well before midnight when he went to sleep. He slept lightly anyway; what woke him was less a sound than some vague susurrus.

He opened his eyes in a shaft of moonlight through the window to see Laelia standing over him, perfectly naked except for a cloak that hung from her shoulders, and with a knife that looked ten feet long in her hand.

"Ah!" she said. "So you know you are going to die."

Anthony acted on impulse. "Drop that silly thing," he said in the tone one would use to a child, and as her hand hesitated, rolled over, caught her shins with his feet, and as she lost balance, grabbed the knife-hand. She beat at his face, surprisingly strong, but he got the knife-hand behind her back in a hammerlock, and as she began to scream, twisted it until she dropped the weapon, then flung her on the bed, where she lay, panting and sobbing.

The Goth came in, wide surprised eyes glancing from one to the other. Anthony kicked the knife on the floor. "She tried to kill me," he said. "Is this the way you take care of me?"

"But Master," said Rincimer. "She came to the door and said you had sent for her. How was I to know she had a knife under the cloak?"

"You didn't even come in when she screamed."

"A man has a right to beat his woman. Shall I cut her throat?" The Goth's eyes lighted with anticipatory pleasure.

"No. Go back to your post. I want to get at what's behind this." He picked up the knife, threw it to the other side

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of the room, then pulled the girl to a sitting position. Her hands went to her face, and the sobs became broken.

"I want you to tell me why you tried to do it," he said.

"Because — because — you're in love with that Senator's daughter and—don't want me—any more."

"Who told you that?"

"Phylargyria."

News certainly got around fast in that palace. "Who the hell is Phylargyria?" demanded Anthony.

"She belongs to Lantentia, the wife of the Senator."

"How did she know?"

There was an obstinate silence. "Shall I call in Rincimer and have your throat cut?"

"I don't care."

This wasn't getting anywhere. Anthony sat down beside her and smoothed her hair. She put her arms around him and began to cry again, a little. He kissed her and said, "Don't you see? Somebody started this on purpose, to have me killed. I'm not blaming you too much, but I'm trying to find out who's behind this, and I want you to help."

"Phylargyria's mistress told her to tell me," Laelia sobbed, "Oh, I'm sorry, I'm sorry. I didn't mean it, but I couldn't help it."

He said, "You're forgiven—especially if you help me find out a little more. Why should Lantentia do a thing like that?"

She said, "Do you really mean you don't know? Every slave in the palace knows that Senator Lantentius is working for Constantius Chorus, and when you said you thought Valeria Augusta's marriage to Galerius should be prevented, that meant you didn't want Constantius to marry Theodora, the divine Maximian's daughter, either. Now if you really forgive me, kiss me again and be nice to me."

THE FIRST order of business in the morning was to send for a city aedile and sign an order for Laelia's manumission. It was the least he could do for the girl. She was a first-class dancer and should have no difficulties, even in making a good marriage, though Rincimer reproached him for being foolish and argued about how much fun it would be to see somone you really knew eaten by tigers in the arena. The only argument that convinced the Goth was that due to the Busyris rebellion in Egypt, there hadn't been anything from Africa for some time except Mauretanian lions, and they weren't very amusing.

After this and the daily minor detail were taken care of, Anthony sent the slaves away and summoned Statilior to sit down. "I need your advice," he said.

The little man might get excited under pressure, but he was no fool. He said, "I could see you had something in mind, Lord. What is it?"

"Why should Senator Latentius want me out of the way?"

"I don't know that he does, Lord. Of course, he is Constantius' man in Rome, but you have never done anything against Constantius, and the Senator is a very logical man, who never acts from anything but interest."

"I'm not sure but I have interfered with his interests," said Anthony, and suddenly deciding that as long as he was going to use the little prefect of pages, he might as well use him to the hilt, gave the whole story of the midnight interview with Valeria and as much as was discreet about the noon one with Berenice and the other midnight passage with Laelia.

When he had finished, Statilior tapped his teeth and said, "I follow your thought, Lord, but doubt your conclusion. Or let me say rather that I think Constantius may be behind this, or his advisers, but not for the reason you think. You knew that Constantius' son, Constantinus, had been flirting with the Christians, did you not? And Lantentia is suspect of being a concealed Christian? And her slave Phylargyria, like many slaves, probably is one? It's said these Christians have their associations for murdering officials; the more officers

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of the empire that fall, the greater the general anarchy, and the happier they are. They tell me the Christians are a political group, masking their motives in philosophy. I think, Lord, that this is a simple Christian plot against you, which could have been directed against any other as well—say the Praepositus."

Anthony smiled wryly, thinking of how wrong the analysis might be. "Nobody tried to get his mistress to murder him," he temporized.

"How do you know, Lord? Would he tell it abroad? And for that matter, does the Praepositus Anfidius have a mistress?"

"However," said Anthony, "that's not the point, and we're really rather wandering. The Praepositus Anfidius is being very co-operative with me just at present. What I'm most interested in is finding out why Lantentius or his wife wanted to get rid of me as soon as they found out I was interested in not having Valeria marry Galerius. And secondly, who was hiding behind that curtain in the Augusta's chamber."

STATILIOR nodded comprehendingly. "I see. It must be made dangerous to plot against you. I have among the pages a little Lusitanian whose mother is a witch. If we find the person, she could be induced to cast a spell—"

Anthony said, "That doesn't sound practical. Not that the spell wouldn't work, but what we want to achieve is one of two things—either that anybody spying on me—or Valeria Augusta—isn't going to live long. For that, we need something done in public, a trial before a magistrate."

"Lord," said Statilior, "it ought not to be beyond my resources to discover what page it was who concealed himself in the room of the Decii while you were there. There would then be a case for unauthorized intrusion on the Augusta, a crime clearly punishable by having the eyes torn out. I will use my best—"

He stopped as the major-domo stood bowing before them. "What is it?" asked Anthony.

"Lord, the Praepositus Anfidius Cappodolaris."

"Admit him."

The Grand Chamberlain came across the room with the peculiar swinging walk which unconscious memory assured Anthony was the gait he always used, lifted a palm, said, "Hail!" and sank into a chair and looked at Statilior.

Anthony said, "You may leave. But proceed with the project."

Statilior saluted and ducked away. Anfidius turned and waited till he was well through the door. Then he turned back and said, "A fortunate day on which you clearly owe a sacrifice to Mercury. I congratulate you."

The devil you do, thought Anthony; how do you know so much? "My Lord," he said aloud, "I did not know I was in need of congratulations."

Anfidius had extraordinarily heavy eyebrows, which went up and down. He leaned forward and tapped Anthony on the knee. "You play with me," he said, "like a Thracian with a pair of swords. Will you not become accustomed to the fact that I am not your enemy, but your ally? We have the same objective; namely to prevent the marriage of the Caesar Galerius and Valeria Augusta."

Yes, and you want to accomplish it by feeding my sweetheart to the old goat, thought Anthony. He said, "What has that to do with congratulations?"

Anfidius puffed out his cheeks. "I have already told you—already told you, I believe, that thanks to the exalted office the Emperor has given me I have sources of information not generally available. . . . Not spies, you understand, not spies. Just certain persons willing to oblige the Praepositus."

He paused, and Anthony waited. After a minute the Grand Chamberlain went on, "It came to me too late, really too late for a warning, though I did try to send one, that a plan had been arranged against your life by the Senator Lantentius."

"Not Lantentia?"

"No, the Senator himself."

"Is he a Christian? I have heard that

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his wife may be."

Anfidius smiled as though they were now talking the same language. "She may be; in fact the people who inform me rather think she is a member of that revolutionary sect. But this has nothing to do with it."

"Interesting. Go on."

"You knew that Lantentius was Constantius Chlorus' secret representative in Rome?"

Anthony nodded and said, "I have heard it said."

"It is true. You may take it as established. It is true. Well, then, that does Constantius want?"

"Probably to beat the rebels in Britain and recover the island."

Anfidius said, "You are being difficult again by throwing up a pretense of naiveté. Constantius wishes to become Emperor."

"No doubt."

"What prevents him? Your presence in Rome, my dear Castrensis. With the organization of palace pages you control, he knows that any step he takes will be reported to the divine Diocletian. Of the few friends who occasionally gave me information, he does not know." Anfidius smirked. "But that is of little importance. I know, but I cannot act. He knows you can act. Therefore he proposes to eliminate you. A simple proposition."

Anthony said, "There are a couple of points I don't quite understand. In the first place, what does Lantentius propose to do? And in the second, why can't you act as well as me?"

THE PRAEPOSITUS spread hands. "I will answer the second question first, although it is unnecessary. As Castrensis, you are a military office, even though you have never exercised command in the field. Well—you could call on the city legion, the XIV Venus Victrix at Aquileia, and the XXIII Traiana from Volturnam. Within three days the city would be in your hands in the name of the divine Diocletian. I can only send expresses."

Anthony felt a thrill of power at the thought. The fellow was very persuasive. Still he said, "Go on."

Anfidius puffed out his lips again. "We are loyal—loyal servants of the Emperor," he said. "Lantentius intends disloyalty. He wishes you eliminated, so there will be no Castrensis. Then he will have the Senate elect Constantius as co-equal Augustus. The divine Diocletian, far away in Egypt, can hardly prevent the elevation without a war with Constantius, which he would never accept. The divine Maximian after his defeat on the shores of Britain, would be forced to allow it. So then you have three Emperors, which you yourself have said would be dangerous."

Anthony said, "I see. All very neat and pretty. But what am I supposed to do?"

Anfidius leaned forward. "Be ruled by me. While you are in the city, Lantentius can attempt nothing—nothing. Well, remain here, instead of going to see the divine Diocletian, as you have proposed. To do so would be the ruin of the very reason for preventing Valeria's marriage to Galerius, for with you out of the way and Constantius proclaimed Emperor, the succession question would be worse than ever. Why, even his son, Constantius would be eligible, in which case Hercules preserve us all! With his Christian connections! Are you afraid of another attempt at assassination?"

"No—o," said Anthony slowly.

"Because I can perhaps have some of the people who supply me with information help in your protection." He stood up, then surprisingly came over and kissed Anthony on the cheek. "Farewell, my dear Castrensis. It is a pleasure to co-operate with a man who understands human fate and the forces of destiny."

After he left, Anthony decided that there were only two people through whom news of the attempted stabbing could have leaked out, and those two were Laelia herself and Rincimer. He doubted whether Laelia would make it

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an item of gossip. That Goth was certainly overdue for a wigging.

XII

ANTHONY decided that in view of how tired he was, he would send the Prefect Vespilianus his regrets and dine in his apartment. Agria was not equal to much beyond roast pork with onions and anchovies, but that would preserve life, the bread would be good, and he wanted to think out the implications of the message that one of Statilior's pages had picked from the scrip of an imperial courier while he was coping with wine in a tavern at the Janiculum gate. It was from the Caesar Constantius to Senator Lantentius and reported that a siege was being laid to Gesoriacum, the rebel Britons' continental base, and that the troops were in good health and spirits, with confidence of an early victory. There was nothing at all in it about being proclaimed Emperor, or any other intrigue for that matter; a perfectly straight soldier's dispatch from the front, whose secret meaning was extremely well hidden if it had one. And yet Lantentius had made that speech in the Senate only yesterday . . .

There were two sets of tablets beside his plate. He called, "Burinax!" and when the slave appeared, "Where did these come from?"

"Master, I do not know. Both were thrust into my hand at the door by slaves I had never seen before, who told me to give them to you privately. An unheard of thing."

"You may go."

Anthony frowned and broke the seal on the first. "A favor for a favor," it read. "She who brought you to the court of the cypress asks you to remember your promise. It is now four days and the hours draw in. Why are you still in Rome?"

No signature, no salutation, no seal, but clearly Valeria Augusta. And a perfectly good question. Why was he still in Rome? He paused for a moment to muse over the question before opening the second set of tablets, and decided in honesty with himself, that it was not so much any argument Anfidius had laid down as the desire not to be away from Berenice. Anything might happen. He was still thinking about this with the back of his mind when he broke open the second set of tablets. It was as Aesopian as the first.

"To the Greek—" it began, and he realized with a mild jolt that although he was a Roman citizen and a Castrensis of the empire, Antoniades was a Greek name "—who could have thrown the ashes of a dead love to the beasts of the arena: one whom you know, while dancing with her body does not forget her ears. Be warned: the jewel you prize is being taken eastward as a sacrifice to the rising sun before tomorrow dawn. Beware Tarentum."

It was in a hired scribe's hand, clearly from Laelia, who was too illiterate to have written it herself, but not too unintelligent to have composed it. "The jewel—" he had given her trinkets, but no, this was "The jewel you prize." Among slaves and public performers there was a vast fraternity and exchange of information, even when they were not Christians. She must know all about Berenice-Barbara, there was no concealing it. "Eastward as a sacrifice to the rising sun," could mean only one thing: Galerius was Caesar, not yet Emperor, the rising sun; Berenice was being taken east, to Bithynia, where he had his legions, in expectations of a Persian war, to marry him. Anfidius' plan, but not being executed by Anfidius, who wanted to stay in Rome. "Beware Tarentum" was not quite so clear; it might refer to the Tarentine war in the days of early Rome, in which case it would be some reference to keeping the gown washed white, that is, keeping your own nose clean and not getting involved in anything illegal. No, wait a minute; this was a warning that "they," somebody—was taking Berenice eastward. Appius Claudius had been the great figure of the Tarentine War, Tarentum was one of the leading ports of

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embarkation for the East, and it was best reached by the old Appian Way. Laelia was trying to tell him that Berenice would be taken down the Appian way to Tarentum and there put aboard a ship for Bithynia and Galerius.

A thrill of gratitude and sympathy for the dancing girl went through him.

He leaped to his feet and called, "Burinax!"

AS THE slave came trotting in, he was already taking his traveling cloak from the rack at the side of the room. "Make me up a scrip of food," he said, "and order the carriage. I shall have to travel all night. Tell Statilior and anyone else who asks that I have gone to Tarentum on urgent imperial business."

The slave's eyes went sidewise at this utterly unreasonable demand, but he was too well trained not to recognize it as urgent. He ducked his head and scuttled away, while Anthony checked his seal, went to the locked chest and supplied himself with money, and got out a scroll of maps. With luck, and supplying himself with new horses at the imperial post-stations, he ought to be able to reach Torracina before whatever convoy was taking Berenice down to Tarentum. There would be at least a century of the XXIII Traiana there, and he could use his official position to have them stop the group. He buckled on a sword, not that he knew how to use it, but in traveling it emphasized one's status, and turned to meet Burinax, bowing before him in a surprisingly short time with the scrip of food.

The order from the menu, he decided when he got into the carriage and opened the scrip in the dark, should have been a trifle more precise. The scrip was filled with bread soaked in olive oil and garlic, with some pieces of fish that had been around for quite a while. He did the best he could, taking in enough to dope off, and rode roughly and without comfort until he was wakened from the best sleep he had had during the night by someone shaking him and saying they were at the Tripontium post station.

Anthony pulled himself together, got out on stiff legs, and went into the station where the officer in charge, a fat man with a cast in one eye, who obviously resented the existence of big brass represented by Anthony's seal, said no, he hadn't seen any special convoy going through with a girl in charge.

Anthony said, "Not the Praepositus Anfidius Cappodolaris?"

"Certainly not. I know my duty."

Just what he meant by this was not clear, but the negative was emphatic. Anthony looked out the window to where a dirtily-dressed girl with a stick was driving a squadron of geese down the road, reflecting. It wouldn't have the appearance of a kidnapping operation. Anfidius had Berenice's father on his side, and Berenice quite definitely was papa's girl, no matter what her own preferences were. Probably the Senator himself would be with her. He said, "My friend, the Senator Claudius Ausonius did not go through during the night, did he?"

"That was two nights ago."

Anthony staggered, for a moment doubting his ears. Then he remembered that the Romans had no time sense, as a person from his world would conceive it. "Tomorrow" might be several days away, and "yesterday" several days behind. The tablets from Laelia had been delayed in delivery by someone who took this amiable view, and Ausonius and his daughter had a considerable head start. There was nothing to do, though, but press on at the best possible speed. Ausonius might be hurrying, but he couldn't push too fast because of the girl, and an unhampered man ought to be able to make up the gap in the distance of something like three hundred miles. He said, "I want a change of horses and another driver. Is there a tavern open at this hour?"

"Three doors down. Clemestrina's."

He had the curtains of the carriage rolled up, so that at least there would be something to look at, and told the driver to trot the horses, they could be changed

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at the various posts. That, however, was an experiment that had to be soon abandoned; the jolting of the springless carriage became simply intolerable to a carcass already sore with the all-night ride. The result was that twilight found him only at Luctus Feroniae, and even then so tired he could barely move. Some rest was imperative; he got some hot food and a bed at an inn, leaving strict instructions to call him after a few hours, but even that scheme was ruined by an officious officer or *viarii*, the road police, who had heard of this hasty journey at the posthouses and routed him out to explain.

After that Anthony gave up and made a night of it, waking just before dawn. This turned out to be a stroke of luck after all; there were two imperial couriers at the posthouse, bound for Baia and Neapolis with dispatches, and they had an official galley waiting for them at Tarracina, which would carry all straight-line across the Amyclan Gulf, cutting off the sixty-odd mile circuit and permitting Anthony to pick up the Via Appia again for the climb into the mountains.

IT WAS pleasant on the deck under the awning, listening while the hortator struck out his beat for the rowers, and one of the couriers turned out to have an inexhaustible fund of stories of the salesman-and-farmer's daughter type, so that when Baia was reached just after the close of a dramatic sunset, Anthony felt relaxed enough to try another all-night ride. It went more slowly than the first, being mostly climb, and at Capua nobody knew anything about Senator Ausonius and his daughter, so that Anthony had a momentary dreadful feeling that the Senator might have turned off to Neapolis and taken ship from there.

But he remembered that no Roman in his right mind would make the sea voyage around the boot of Italy if he could possibly cut off part of the journey by land, and kept going; at Caudium next day he got his reward, for the head of the posthouse remembered Ausonius and said he had passed through less than twenty-four hours before—a clear gain, and a long one. Push on.

At Aquilonia, after another part-of-the-night run, he was only three hours behind, and the posthouse keeper, hinting that it was a service which should be adequately paid for, suggested sending his son on ahead on a riding horse to beg that Senator Ausonius and his suite wait for his good friend. The suggestion triggered something off in the mind of Anthony, who had been moving like a mechanical man the last two days in the intervals of his fatigue, and he suddenly realized that he should have done his staff work better. The nearest military stations were now back at Neapolis and ahead at Tarentum. He was an officer, but with no troops, in the middle of Calabria, where local authority was represented by the town prefects, who through the *correctors* ultimately came under the Praepositus Anfidius, and the *viarii*, who were also under Anfidius' civil administration.

And the Praepositus Anfidius was not a man who did things by halves. Now that he came to think of it, it was as near certain as anything could be that the Viarian officer who had routed him from bed at Luctus Foreniae had his orders from Rome, not to stop Anthony, but to report on him. Anfidius was willing to let him go ahead and catch up with Senator Ausonius if he could.

Why? Anthony asked himself as the carriage jounced over the stone blocks and a peasant working in a field stopped digging to shade his eyes and gaze at it. Clearly, because he, Anthony, couldn't do anything if he did catch up. They were in the middle of Calabria and no soldiers available for sixty miles. The good Senator would very truthfully tell him that he had no business interfering with a trip being made by a man of senatorial rank and his own daughter. Also, the posthouse man had spoken of the Senator's "and his suite." That

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meant he had a bodyguard with him, and since this was Calabria, the best guess would be that it would be made up of those brigands who are partly on one side of the law and partly on the other. No, Anthony decided, he would become a decidedly poor risk if he caught up. He leaned forward to tell the driver to take it easy, and at Pinum on its hill-slope among the scraggly dark trees, was a good night behind. Anfidius was going to lose this round in spite of his careful planning.

XIII

TARENTUM was a bowl around the double harbors. The carriage picked its way down through narrow winding streets of brick buildings, past sellers of garlic, wines, goat's meat and silks from the Orient, to the headquarters of the naval prefect. He proved to be a hawk-faced man bearing the old Roman name of Lucius Murtius Scaevola, but having every other indication of being a Berber from Africa. He looked at Anthony's seal carefully, kissed it, and said, "It is not frequently that we have an officer of the court through here. The last was the new praetorian prefect going out to meet the Caesar Galerius. I trust it is not a matter of rebellion that brings you here?"

He looked nervous. Anthony smiled to put him at his ease and said, "Not at all. After all, I'm only technically a military officer, and if it were really something serious a legate would have been sent. As a matter of fact . . ." he looked at the slave hovering in the background.

Murtius looked too, and then gestured. The slave vanished. "I trust your health is good?" said the naval prefect.

Anthony recognized the gambit and settled himself for a lengthy conversation about insignificant matters. After they had discussed the weather, the slowness of Egyptian corn-ships, the Emperor Maximian's campaign in Gaul and how hard it was to get good saffron, Murtius leaned forward. "Is there something special I can do for the head of the household military establishment?" he asked.

Anthony said, "It's a private emotional matter. I'm in love with a young lady, and her father has come to Tarentum to take her off to the East."

Murtius cracked his finger-joints. "Ah! Ah!" he said. "And you want me to have him—so many accidents happen in Tarentum."

"No, I don't think it would be—well, polite to eliminate him," said Anthony. "He's a Senator and has the protection of the civil authority, the Praepositus. But I'd like to keep him from sailing."

"Ah, yes. Very clever of you." He glanced at Anthony sidewise. "It may be expensive. I shall have to use delators."

Delators were detectives or stool-pigeons, according to how you took it. Anthony said, "You have a local branch of the fiscal administration here. I will sign the warrant for any expenses."

Unconscious memory told him that this was the big chance, but it was a big chance he had to take. Even the warrant he could sign wouldn't be much help if Murtius decided to ask for an inspector of accounts and delay matters for a week or more. He could practically see the wheels going around in the man's head as he closed his eyes and then opened them again. Then the combined appeals of assisting an amorous intrigue and padding the expense account won out. Murtius said, "It will be done. What is the Senator's name and where is he staying?"

"His name is Claudius Ausonius, and where he's staying I do not know. He came in by private convoy about five hours ago."

"Five hours?" said Murtius.

"A watch," said Anthony.

The naval prefect clapped his hands. When the slave appeared he gave rapid orders, then turned. "There is nothing to do now but wait," he said. "It will give me pleasure to entertain you." He looked out the window. "It is a little early in the day for girls, but—"

"Skip it," said Anthony. "The only

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girl I'm interested in is the one I'm after. If you really feel you have to entertain me, I'd like to look at your dockyard."

They were building a new bireme, and Anthony admired the skill of the adze-men going down her side, fining her planks, for a while, but he couldn't seem to forget about Berenice and the chance of losing her, so he hunted up a tavern, sending word to Murtius where he was to be found. It was too early in the day for there to be many customers; Anthony had to settle for the conversation of a garrulous veteran who had lost the fingers of his left hand in the Persian war, ten years before. It was not the Emperor Carus who was the hero of that conflict to his mind, but Galerius. "An old soldier, a real Roman," he babbled. "At the capture of Ctesiphon he chose the women he wanted by knocking them down as they were led past." Anthony thought of Berenice and fidgeted.

AT LONG last a slave came in, asking for him. Murtius Scaevola was outside in his litter, a big one with sixteen matched Britons as bearers. "Get in," he said. "I have the information, but if you really want to catch your Senator and his daughter, you'll have to hurry. They've already sailed, in a corbita for Chalcedon. Going down the outer harbor this minute. I've ordered out a trireme for you, and you should be able to catch them if the wind holds light."

Anthony made a rapid calculation. Murtius was smart; on the water civilian authority was suspended and the military in control. He had a perfect right to order Claudius Ausonius back to port and Senator though he was, to hold him for investigation for having made an unauthorized voyage. He said, "This is very decent of you. I don't doubt that the investigation was expensive."

Murtius smiled and ran a tongue across rather wet red lips. "It is always good to serve the interests of Eros," he said, "although my own favorite god is Mercury."

The motion of the litter-bearers was surprisingly smooth, and they were even more surprisingly rapid. It seemed no time at all before they were at the dock, where the decurion in command of the trireme waited at the gangplank. His name was Rutilex and hers was *Ariadne;* a competent, businesslike man with a short, curled beard who went through the ceremonial salute in a perfunctory manner, then hurried Anthony aboard.

"There is a good deal of wind outside the harbor," he said, "so I am anxious to be started. A corbita could easily gain so far on us as to be covered by night."

He shouted orders. A trumpet blew; the trireme was shoved free; the hortator began beating on his table with his gavel, and the *Ariadne* smoothly picked up speed. It was a blue and gold day; Anthony could not help but admire the white stone and red brick of Tarentum around its bowl as he looked back.

Rutilex beside him touched his shoulder. "There she is," he said, pointing, and Anthony saw something white, far out on the horizon. It seemed impossible that they could catch that distant, dancing shape, but the hortator moved up the beat and the corbita began to take on shape as a two-master with little split triangular topsails. Anthony looked at the rowers; sullen-faced, sun-browned and naked, with a few Negroes among them. The overseer walked the runway between them, his whip suggestively in hand, but he had not used it yet. Up in the bow the little group of naval legionaries were clustered around the catapult, their helmets on the deck beside them.

Rutilex spoke again, "It is well so far, but I do not like this wind. Are you going to have him tortured when you catch him?"

It occurred to Anthony to be glad that he was probably not a permanent resident of the divine Diocletian's time. He said, "I think not. This is a civil matter."

Rutilex shrugged. "We are at the orders of the Emperor," he said, as though losing interest.

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They were pulling up slowly on the corbita. He could see the steersman beyond the high, curved stern, pulling hard on the steering oar to keep her steady, and little figures on the deck below watching them. Behind the coastline had sunk to a blue in which individual objects were no longer distinguishable. They were perhaps five hundred yards behind the chase when suddenly the corbita seemed to leap on ahead of them.

As quietly as though he were ordering a glass of wine, Rutilex said, "The whip."

THE overseer moved down the line of rowers, applying it. The men snarled, groaned and pulled; the trireme leaped forward, they were four hundred yards away, three hundred, two hundred.

Rutilex, estimating the distance carefully, said, "We can't make it. My rowers will tire first."

A memory leaped into Anthony's mind of something he had read—where was it? In Rudyard Kipling. He said, "Do you have any stones aboard. Really big ones, I mean."

"In the ballast, I think," said the decurion. "Why? Do you want to crush her?"

"No, but I have an idea," said Anthony. "Have a couple of them brought up to the catapult, and let's stop whipping the rowers. If we can keep even with them, this will be good enough."

The decurion shouted orders and led the way forward. Over on the corbita, with her sails bellying out as she heeled to the wind, a row of heads appeared along the rail, wondering what was going to happen next. One of them shouted some derisive comment.

"Now," said Anthony, "I want you to use one of those stones on the corbita, but not to hit her. Aim for the foresail, near the top if possible. If you hit it in the right place, she'll capsize."

Rutilex said admiringly, "I thought you palace officers didn't know anything about the military business, but I see I must change my mind. Aim well!"

The soldiers winched the catapult back, balanced the stone on the slide, and one of them pressed the trigger. With a heavy *ping* the rock flew through the air, but as it did so the corbita dipped to a swell and it splashed beyond her.

"Try again," said Rutilex. The corbita was gaining, but they evidently were aware of what was going on, for there were yells and a bustle on her deck. The legionaries sweated the second stone into position; at the same moment, over on the corbita, two men appeared on the quarterdeck with a woman between them. Her hands were bound in front of her and even at this distance, Anthony could make out that it was Berenice.

Three things happened at once. He called, "No!" just as the stone was released, and as it arched toward the sailing ship, the two men threw Berenice overboard and he dived.

An oar just missed his back as he went under. As he came up, swimming a crawl stroke that he realized with the back of his mind must have been astonishing to the Romans, he caught a glimpse of the corbita lying on its side with its bottom a surprising bright blue, and the *Ariadne* just changing course to ram. Then all his efforts were concentrated on the job of reaching the helpless girl in the water.

XIV

MURTIUS handed him the message and politely turned his back while Anthony read it:

"To the Clarissimus Castrensis Antoiades from his friend the Spectabilis Praepositus Anfidius: If you are well, I am also well. In our present circumstances it is a misfortune that you must quit the city to seek an unattainable goal, but I trust good fortune will soon return you to us. Get in touch with me on your arrival. I have news of our mutual friend."

It had come by imperial courier, which demonstrated that Anfidius was on his toes, and it was accompanied by one of

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the Tarentum city aediles, which demonstrated that the Grand Chamberlain had allies. Gaius Nantuades was his name. He was seated on the opposite bench right now, oozing perspiration around a battery of chins, and indicating that he intended to be as difficult as he possibly could. Also the letter, though couched in the friendliest terms, was very definitely a warning. It emphasized the difference in Anfidius' legal status and his own, and was intended to be a warning that Barbara-Berenice was also a *spectabilis,* and for him, untouchable.

"May I ask what you propose to do?" said Nantuades.

"Marry her," said Anthony. "She's willing."

Nantuades twisted his mouth. "Such a marriage would not be legal without a guardian to give her away."

Anthony checked; the man had a point there, and there would be people, Anfidius among them, not anxious to have the marriage legal. He said, "Well, then, we'll go to Rome, find out who her guardian is, and make it legal."

Nantuades said, "It is not permissible for you to take her to Rome. Under the law of the divine Aurelian, that would cause such a loss of status as to make her a *femina egregia,* and there would lie an action against you under the estate of her recently dead father."

Anthony said, "What is it your idea that should be done?"

The fat man was both quick and specific. "Ausonia Berenice, lacking a father, is under the guardianship of the imperial administration. She is to remain at Tarentum, until it is determined who is her legal father, and he will then make the necessary plans for her."

Anthony said violently, "I'm damned —" but Murtius held up his hand, and with an expression of intense Berber cunning placed one finger beside his nose. "One moment," he said. "The lady in question is, I believe, at my house now, getting into some dry clothes. Do you agree, Gaius?"

Nantuades said, "I believe that is the case."

"Good," said Murtius. "Then she is under the jurisdiction of the port and not of the town. And I am the chief magistrate of the port."

Nantuades said, "But this is a civil matter. . . ."

"Not if it falls in the jurisdiction of the port. And as chief magistrate of the port, it is my duty to furnish her with a suitable guardian."

He looked around, as though searching, and his eye seemed to fall on Anthony. "Oh, there you are, Antoniades. A more suitable guardian for a young lady I never saw. Give me one sesterce. Thank you. Aeneas!" And as the slave hustled in from the anteroom. "Record a deed of sale. As legal guardian of Ausonia Berenice, I sell her in free title to the Castrensis Antoniades for one sesterce. In law and fact, he is now her father and may dispose of her as he pleases." He smiled at Nantuades. "I am sure there is no law against a Roman maiden traveling to the capital with her own father."

Anthony said, "Hey, wait a minute! I can't marry her if—"

NANTUADES was rising, gathering his toga about him with immense dignity. "No, such a marriage would be incestuous and illegal," he said. "I find it my duty to report the circumstances of this transaction." He stalked out, scowling darkly.

Murtius grinned through his red lips. "Fathers have a great deal of responsibility with regard to their children," he said.

He should have noticed. The trouble was that he was too taken up with Berenice, the wonder and splendor of her presence there beside him in the carriage, being able to touch her whenever he wished, hearing her talk about inconsequential things, like an Egyptian doll she had had which looked more like Pollux than any of the images in the temples. But he should have noticed.

There were too many imperial couriers.

It only occurred to him when the car-

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riage reached the Aufidian Bridge, across that ravine in the mountains, and there were eight spearmen, lined up solidly across the roadway, just short of the bridge.

They had round targetshields and Phrygian caps and they looked thoroughly businesslike.

Berenice gave a little squeal. The driver, instead of trying to turn his horses and make a break for it, pulled them up, laid down his reins and covered his face with his hands as the spearmen approached, evidently expecting to be butchered on the spot. Then the spearmen were all around them. Their leader, a dark, stocky man with a badge on his shoulder, addressed himself to Anthony, "You are Regulus Antoniades, the Castrensis?"

Anthony nodded with a dry throat.

"Then I must ask you to accompany me; not as a prisoner, but as one receiving a guard of honor for a visit to a country estate." He turned to the driver, who had begun to sob. "Be quiet, you fool! We're not brigands." Then back to Anthony. "May I have the honor of riding with you, *clarissimus?*"

Anthony smiled wrily. "I don't see how I can very well prevent it. After all, the gods are on the side of the big legions."

The man, with one foot lifted to climb in, threw back his head and laughed. "That's very good," he said. "Very good. May I repeat it?" He got in and sat down facing the pair, while the spearmen formed up, three on either side of the carriage and one in the rear.

Berenice said, calmly, "Forgive feminine curiosity, but where are you taking us?"

The officer said, "For a visit to the estate of the Praepositus Anfidius Cappodolaris. He feared you had become overtired with too much rapid traveling, and wished to give you an opportunity to rest."

"I thought it might be something like that," said Anthony. Berenice reached over and put her hand on his. There didn't seem to be anything more to say, and there was nothing at all that one could do for the moment.

THE carriage crossed the bridge and, directed by the leader of the spearmen, turned leftward up the stream on the north bank along a rather rough hill track that had the spearmen beside it stumbling. Anthony debated offering the head of the spearmen money, then decided against it; he looked both competent and steady. Ahead, the track wound round a shoulder which, as they reached it, opened out on a green valley running down to the river with a villa at its center. Smoke rose from one of the buildings at the rear; there were sheep and a few cows farther up the valley.

The carriage drove up to a wicket gate, where an old man came out of the gate-house to open, and they were in the courtyard of the villa, with the inevitable fountain and pillared colonnade around the edge. As a half-naked slave came out, the leader of the spearmen jumped down and said, "Tell the master that his guests have come," and reached up a hand to help Berenice. Anthony looked around; the spearmen were still close and there was no chance of a break.

There was a wait. Then Anfidius came along the colonnade, his face wreathed in smiles. "Welcome to Villa Rubrica!" he said. "What a pleasure to have you both here! Would you care for a bath and some refreshment?"

"I think I can dispense with it," said Anthony, a trifle grimly. "What I want to know is what we're here for."

"A rest . . . a rest." Anfidius led the way into a room with a high window, bowed graciously to Berenice, and indicated that they should sit down. "Ausonia Berenice will be in especial need of it before resuming her interrupted journey eastward." He smiled. "I have taken the liberty, my dear, of arranging for a commercial ship for you at Sipontum."

"But I don't—" began Berenice, and Anthony cut in, "She's not going east."

"But of course she is," said Anfidius. "Let me explain and I'm sure you'll un-

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derstand. Since she is now fatherless; she is the ward of the imperial estate. And since I am the head of the imperial civil administration, I stand in the legal position of her father. It is my wish that she should go east to be presented to the Caesar Galerius."

Anthony said, "But she isn't fatherless. I was made her father in legal form by the prefect of the port before we left Tarentum."

"Hercules!" said Anfidius, and stood up so abruptly that the vase on the little table beside him hit the floor with a crash. His face was white, and looked suddenly drawn. "Hercules!" he repeated. Then, "I could have your throat cut, you know."

Anthony felt a chill grip at him, but he said, "I don't think you'd quite dare do that. After all, I'm an imperial officer."

Anfidius' hand went to his chin. "No," he said as though talking to himself in a low voice quite different than the one he had used before. "No, I wouldn't quite dare. It would introduce an even worse time-nexus. . . ."

Something hit Anthony with the force of a stroke of lightning. Triggered off by Anfidius' phrase it was the memory of the word the man had used for "Get in touch with me—" in the message to him at Tarentum.

The word was *telephonare.*

There wasn't any such verb in Latin. There wasn't any such thing.

He said, quite calmly, "Then you're from another time-circuit, too."

For one breathless moment Anfidius stared at him. Then he clapped his hands, and as a slave came in, said, "Conduct this lady to the women's apartments and give her anything she wishes. I am going to be in the cabinet on the upper floor in consultation with my friend, the Castrensis, and I do not wish to be disturbed."

XV

"I PERCEIVE," said Anfidius, "that you are less advanced than we are, and indeed, less advanced than I had hoped. You do not, for example, understand the theory of the nexus."

"You could explain," said Anthony.

"I am afraid it would do very little good in view of your lack of technical knowledge. I can only assure you that there is such a thing and ask for your cooperation."

"It seems to me that I've heard you use that phrase before," said Anthony, "when you didn't know I was a time-traveler, too. But go ahead, shoot, I'll listen."

Anfidius blew through his lips. "I will not attempt to labor the matter," he said, "but it is very important that the Caesar Galerius should not be allowed to make his Persian campaign."

"But Galerius isn't anywhere near Persia," protested Anthony. "That is, unless you have some of that new and very private information. The last I heard he was in Lower Moesia, fighting Scythians—or making peace with them."

"Unless he is prevented he will make a Persian campaign," said Anfidius. "The result will be completely disastrous for Persia."

Anthony smiled. "It sounds rather odd to hear a Roman official talking about avoiding a disaster to Persia," he said.

"You do not understand," said Anfidius. "You really do not understand. Disasters are seldom permanent, but the effect of this one will be to bring Persian territory and dangerous Persian religions into the Empire, while stimulating the Persians themselves into a rivalry that will ultimately ruin both countries, and have the most dangerous effects along this spiral of the time-stream."

"I see," said Anthony, and then something struck him. "Do you mean you can foretell our current Roman future as it was in the area you came from? I can't. I don't know what's going to happen tomorrow, or even whether Constantius is going to get himself proclaimed Augustus, as you suggested when we were in town."

"I wouldn't worry too much about

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Constantius," said Anfidius. "Lantentius might like to do it, but he hasn't much chance. There are too many against the idea."

"Then—" began Anthony, when another thought struck him. "Look here, then you were merely trying to put one over when you wanted me to stay in the city and keep an eye on Lantentius?"

"Admitted, my dear colleague. I wished to give Ausonius every chance to take his daughter to Galerius. It seems I failed—I failed. I did not credit you with so much resource. But then I didn't know you were a time visitor, too."

"I'm beginning to wonder," said Anthony, "whether you weren't behind that other little stunt, too. Getting Laelia to try to kill me. Now that I think of it, you knew an awful lot about that."

"Of course, of course," Anfidius waved a hand. "My people reported that you had enlisted Valeria Augusta on your side in the effort to win this girl, and it was important to have you removed. So I bribed Lantentia's maid to tell Laelia something that would stir her up a little."

It was certainly odd to be sitting there talking quietly to a man who had just admitted he had tried to have you killed. Anthony said, "Thanks for telling me. It makes me feel so kindly and co-operative toward you. But if you're that easy in your mind about it, why did you decide just now that you didn't quite dare have my throat cut?"

"Surely, it should be obvious. If you were killed by your mistress it would be quite a different thing than if you died on my estate. I have no desire to be besieged here by a legion with an indignant degate at its head. It might lead to my failure to accomplish my mission."

ANTHONY said, "By the way, how do you know what your mission is? I know I came here for some reason, to do or prevent something, but beyond certain impulses, which may be purely natural things, I can't tell. How do you know that Galerius must be prevented from a Persian campaign, and what makes you think marrying him to Berenice will do it?"

"By examination of and calculation from the nexus. I told you you were inferior technically. The calculations, which are very precise, give large long-range predictions of probability, such as the impending disaster to Persia, and very small close ones. In the middle ranges, they tend to falter. There was no indication of your presence here, for instance."

"And Berenice?" persisted Anthony.

"The predictor gave a very high order of probability to the idea that if a person of her mental type were married to him, she would have him assassinated at an early date."

She would, too, Anthony thought. Berenice, or Barbara, was a highly practical as well as a very sensitive person, and Galerius, though a good soldier, bore the reputation of being a man with the manners of a stable-boy. Caught in a marriage with him, and with no restraining Christian morality, a little assassination would be exactly her way out. He said, "All right. What happens now?"

"Oh, now that I have secured your co-operation, we can plan together. I suppose the right thing would be for you to give her to one of my bailiffs by adoption. Then as her adoptive father, he could take her to Galerius. It will be an awkward matter to handle legally, though."

Anthony said, "Damned awkward. In fact, it can't be done. In fact, I'm not going to do anything of the kind. And in fact, she's not going to Galerius."

"Oh, but she must. Would you cause trouble to half a world for the sake of one woman?"

There was no use arguing. Anthony got up, slowly, so as not to arouse suspicion, and strolled, rather than walked over to Anfidius. "I think—" he began, and then let drive with a right, a rabbit punch. Down went Anfidius, tangled in his chair, not out, but near enough to it so that it only took a couple more of the same to paralyze him.

Anthony looked around the room.

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There were no hangings, but he easily unwrapped the toga from the unconscious man, and with the aid of his sword to start the process, converted it into strips, reflecting as he did so that his mission around the circle of the probabilities appeared to be that of bopping replicas of George Shepherd. It got a little more violent each time, and there was a clue to something in that, if he were only not too busy to figure it out.

Anfidius grunted just as Anthony got one of the strips tight around his hands. He was clearly coming to, so Anthony hastily made the next strip into a gag. Then he did come to and began pounding with his heels on the floor, so his legs had to be hastily tied up, too. Then Anthony paused to think. The getaway was the problem, first from the villa, and then from the sphere of the Grand Chamberlain's influence, and the fact that he had to find an out for Berenice was a drawback. Any place where there were soldiers would give security, but Aquilonia was the next town, it had no garrison, and long before they could make Beneventum, where there was a cohort, Anfidius would be out of his bonds and after them, either with the *viarii* or his private spearmen. For a moment Anthony debated cutting his throat, then decided it wouldn't be wise; the Emperor Diocletian took an extremely dim view of having his servants bumped off, and while there was an escape back into his own time-circuit somewhere, it wouldn't happen until he had accomplished something, and he didn't know what it was he had to do to get back.

He bent down, searched Anfidius' scrip for his seal, said, "Sorry, old man, that I had to treat you so rough, but I've got a date with a lady, and I can't stand her up."

DOWNSTAIRS he called for the steward, handed him the seal, said that Anfidius was busy with some documents he had brought from Tarentum and that Berenice and the carriage were to be brought around. The man obeyed unquestioningly and she was smart enough not to say anything until they were through the wicket and well on the way to the main road again.

Then she said, "I am glad you won him over."

He said, "It would be better to say I won over him. I left him on the floor with a lump on his head, tied up in his own toga."

She gave a little squeal. "The Praepositus himself! He will—"

"He'll do nothing if we're smart. Remember, I'm your father. I'm going straight to the divine Diocletian and appeal to him on that ground." He glanced at the driver's back and laid a finger on his lips.

She caught on at once. "What did you mean when you were speaking about the time-circuit and he took you upstairs?"

He said, "That is a very strange business, and one which I will tell you about some time, but not now, I think. Does it matter?"

She said, "No—father," and put her arms around his neck and kissed him.

At the bridge he had the driver turn north on the highway. There weren't many people about in this hill country or many farms, though it was still fairly early in the day. He kept looking back for signs of pursuit and trying to make some plan that would be better than pushing straight ahead, but it was as though his mind were paralyzed; he couldn't seem to think of a thing, and Berenice gradually fell silent beside him.

But at the little town of Mons Aureus, the luck abruptly changed. In front of the little inn that was the only place of refreshment available, a line of as many as twenty mules was stamping and switching their tails, tied together, evidently the property of a dealer bound southward. Inspiration descended on Anthony. "Can you ride?" he asked Berenice.

"Not very well," she said.

"Well, you're going to learn fast," he replied. "Stop the carriage."

Inside, the dealer wanted to haggle over his mug of wine, and though he was

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burning with impatience inside, Anthony feared to make himself remarkable by refusing to accommodate him. They picked out a pair of the better mules, and a small, dark shop farther down the street which was something like the Roman equivalent of a general store provided blankets that would serve as saddles, and bridles for the mules. The driver Anthony told to push on to the Aquilonia posthouse with the curtains of his carriage down, and not to answer questions from anybody except the road police. Then he got Berenice on her mule with some difficulty, and they headed back the way they had come.

"Where are we going?" she asked after they were once fairly launched.

"There's a turn-off about half a mile back," said Anthony. "We're going back there and cut eastward into the hills. Anfidius will expect us to stick to the Via Appia, going either north or south, and it will take him some time to figure out our route. Then we're going to the one place he'd never think of looking for us—Sipontum. If he can arrange for a ship there to take you east, so can I, and we'll go straight to the Emperor in Egypt."

That night they slept at the headquarters of one of the state latifundia, in a room where hams and cheeses hung from the rafters.

XVI

BERENICE lay back under the awning on the after-deck and stretched, looking extraordinarily seductive in her light, breeze-blown dress. At the opposite side of the dock a galley was just coming in under oars, the little gilded statue of Hercules in the bow indicating that it was in the imperial service. Diocletian used Hercules as his emblem. Out across the bay ripples were chasing each other under spotted white clouds, and Sipontum town was also white.

"What worries me," said Anthony, "is what Anfidius will do next. He's no fool and has plenty of resources."

"What worries me," said Berenice, "is why you do not marry me at once and prevent anything he may do."

"Because, as I have already explained, there isn't time," said Anthony. "I've got to reach the Emperor before Anfidius does. It's pretty obvious that he will try something there, I don't know what, but I've got to get my story in first. And I promised Valeria Augusta to persuade the divine Diocletian to let her off marrying Galerius; it was part of the deal for help with you, remember? That needs to be done in a hurry, too, because the order for the marriage has gone out, and she'll have to be leaving Rome soon. And it will take at least a week to go through all the ceremonies of purification, so I can marry you after transferring you to another step-father." There was some other reason below the level of his mind that was urging him to hurry to Diocletian. He wondered whether it was part of the time-nexus Anfidius had spoken about, but couldn't locate it more precisely as Berenice stretched again, gave a little sigh, and said, "You are a very strange man. If I did not love you, I would wonder about my own fate."

He reached over and patted her hand, feeling a surge of tenderness for this personality he had followed backward through time. Across the dock, the galley had tied up and her gangplank was lowered. An imperial courier was just saluting the ship's decurion before leaving. It suddenly occurred to him that this vessel must be from Egypt and with news for Rome; Sipontum was the normal terminus, where they could pick up the Via Claudia Valeria. He jumped up so quickly that Berenice gave a startled exclamation, in one leap being at the gangplank of their own vessel and in another at the dock.

"Just a minute," he called to the courier.

The man turned with offense on his countenance, then caught sight of Anthony's badges of rank and saluted.

"Are you from Egypt?" Anthony asked.

"Yes, Lord. From the divine Diocletian, with dispatches for the Senate."

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"Do you know what they announce?"

"Good news. The rebels Coptos and Busyris are slain and their men dispersed. A victory so great that if he did not refuse titles over rebels it would earn him the name Aegypticus."

"Does the Emperor return to Rome?"

"No, Lord. There is word of an incursion of Sarmatians in Pannonia Superior, and he has gone there, ordering up the XIII legion Gemina."

This was news, and it hadn't reached Rome. If Anfidius could be prevented from learning it at once, he would go rushing off to Egypt, hoping to find the Emperor Diocletian there, while Anthony himself went to the real destination, Pannonia. His mind was made up in a second. He said, "The news is so good that there is no reason Rome should learn it immediately. I think you should delay your journey."

The man's eyes showed his appreciation of the fact that Anthony had some intrigue in mind. "I am an imperial courier," he said, "sworn to proceed at my fastest at all times. But—"

"But?" repeated Anthony.

The man looked around. "Sometimes we meet with accidents. They are often quite expensive."

Anthony got the point. He said, "It is regrettable that anything should delay the delivery of the imperial dispatches, but as Castrensis of the military household, it is of course my duty to see that any expenses incurred in the service are met. But I haven't much money with me. I'll have to give you a warrant on the fiscal administration."

The man shifted his feet. "I—he began, when Berenice, leaning over the rail just above their heads, said, "Why don't you come aboard and have a mug of wine while he writes out the warrant?"

The courier's eyes lighted. "Most happy, most gracious," he said, and stood aside to let Anthony precede him up the plank.

Berenice ordered one of the slaves to take the man into the cabin and give him some wine. Then she took Anthony to one side and turned on him, "Don't you know that you've done the most dangerous thing you possibly could?" she said. "He was going to take your money and then hurry to Rome as fast as he could and betray you; I could tell it by looking at him, even if you couldn't. Now there's only one thing to do unless you want to have him killed. That's to give him a genuine accident by having the captain of this ship hoist his sails and put out of here at once. I suppose he'll want to be paid heavily for missing his voyage to Egypt, but that can be taken care of later."

AFTER they got out of the harbor, they decided to run up the coast to Fanum Fortunae and let the courier off there. Berenice-Barbara, who had done pretty well with the mule, was not quite as good at sailing, and thought they ought to leave the ship there, too; it was not quite as short as the water route to Aquileia, but beginning with the Via Aemilia, it would put them on major highways all the way, and from Placentia on they could obtain military transport and an escort, as it was a garrison town.

Anthony found the trip a bore, even with Berenice's company. The corbita they were making the trip in had only eight oars for emergencies, and was miserably slow under sail. The captain, an Easterner of some sort named Bellas, was not only excessively nervous, wanting to run in under the land at night, but also a devout Manichee, determined to convert everyone aboard to his peculiar faith. The first night Anthony talked him out of his timidity by offering to keep the deck himself and being responsible for the safety of the vessel, but on the second night he drifted off to sleep, so it was well over two days, and too late in the evening for traveling when they reached Fanum Fortunae.

In the morning Berenice wanted to start the journey properly with a sacrifice to Mercury, and there was another delay over that, but she proved a good traveler and good companion, and once things got started they moved along

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smoothly enough. Anthony was struck by the number of vineyards as they moved along the road, and by the fact that, although there did not seem to be so many abandoned houses as down the Via Appia, there were also far more of the great latifundia, or state collective farms, and that almost every town held a pottery or brickyard with a neat tablet proclaiming it to be the property of the Emperor. It was a kind of socialism that didn't seem to be making anyone happy, but when he commented on the fact, Berenice only let him know that she wasn't much interested in the lives of peasants.

Placentia proved to be built mainly of brick, and had an unpleasant smell. Anthony installed Berenice at an inn and went round to report himself to the local garrison commander, a Gaul who bore the traditional name of Diviciacus, and who received him as though he were really pleased at meeting the Castrensis. He was sympathetic, but on one point unhelpful, saying, "An escort I can give you, if six men will be enough, but I'm afraid you'll have to find your own carriage. You see this Sarmatian thing in Pannonia is more serious than was imagined at first. They're not the usual lot, but Iazyges from the east, very rough people. The Caesar Galerius has sent three cohorts of his own body-guard to help the local garrisons, and they're in town right this minute, on their way north. I didn't have any advance warning, and mobilizing transport for as large a group as that puts a strain on my resources. The transport they came with belongs to Tuscia, and I'm base-point for Liguria."

Anthony said, "I heard on my way north that the divine Diocletian had finished his campaign in Egypt and was going up to Pannonia in person with the XIII Gemina."

"Good," said Diviciacus. "That ought to take care of the Iazyges all right, but it doesn't help my transport problem. I suppose you want your escort soon after dawn? Obstenax!" He called his secretary.

Anthony turned down his civil offer of a late dinner and went home to his bed on the ground floor of the inn. He was tired and slept soundly, but at some time which must have been around four in the morning some warning sixth sense brought him wide awake to see gray light creeping through the window.

There was someone in the room.

IN AN instant Anthony's conditioned boxer's reflexes brought him out of the bed and behind it. The someone was a big man and he had a sword in his hand, which he ran forward to use, with a kind of snarl. Anthony snatched up the nearest thing at hand, which happened to be a three-legged stool and let fly with it, shouting, "Help!" at the top of his voice.

The stool caught the big man in the chest and threw him momentarily off balance. "Help!" yelled Anthony again, grabbing for his own sword and wishing he knew more about using it. The big man came on again; Anthony shoved the bed against him, but the fellow braced himself and aimed a side-swiping cut that was only just short. Anthony didn't dare try to take the counter-offensive and needed all his attention for that menacing blade. The big man started to swing again—

And stopped his swing with a grunt, then toppled slowly, face down across the bed. There was a three-foot spear in the middle of his back and the bed was getting well soaked with his blood.

"Are you hurt, Lord?" said a voice.

Anthony looked around to see two men in the full accouterment of Roman legionaries in the doorway. Out beyond someone began to shout.

"I must say I'm delighted you came," he said, "but who are you and how did you get here?"

"Felix Dextrippus, decurion of the Valutus Illurici," said one of the soldiers. "The legate Diviciacus assigned us as part of your escort, so we went on duty last night to guard you and the lady. I hope you will not punish us for letting him get in, Lord. We came as

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soon as you called."

"Forget it," said Anthony. "Let's find out who he is, although I have an idea what address he comes from."

Felix Dextrippus went over to the bed and retrieved his *pilum,* clucking over the fact that its point was bent, and wiping it on the bedclothes, and they turned the big man over. The decurion gave an exclamation, "A military man, with officers' badges. Caius, run wake the town commander at once and bring him. This may be rebellion."

By this time the landlord and a couple of slaves were inside the place, gaping and whispering. Felix Dextrippus, who seemed quite competent, got them out into the growing light while Anthony dressed. He expressed his gratitude again as he did so. The decurion held up a hand, "Not at all. I merely thank Mithras that I have been of help to the Castrensis of the military household. There isn't much chance for promotion in a garrison town, and it may get me my century."

Anthony, reflecting that he would make the man a centurion as soon as they reached the end of the journey, tied his sandals in place and went over to look at the corpse in the growing light. The man had a black, straight beard and his badges were marked with the emblem of the owl and rising sun, which was clearly something Eastern, although nothing Anthony could place, either by calling on conscious or unconscious memory. This would be an Anfidius deal, all right . . . no, wait a minute, it couldn't possibly be!

ANFIDIUS was either in Rome or—more probably—on his way to Egypt to see Diocletian. He didn't even know the Emperor had left Egypt for Pannonia. He was not a man who let grass grow under his feet; he must have acted as soon as Anthony and Berenice escaped his trap at the Villa Rubrica. There simply wasn't time for him to have received information, either through the galley at Sipontum, which would be in no hurry to transmit information to Rome, or through the imperial courier from Fanum Fortunae, and to have rushed anyone north to set up a trap for Anthony on the road.

And men with gold officers' badges weren't casual robber-assassins. Therefore someone else was gunning for the Castrensis, Regulus Antoniades. But who? Anthony wished he had Statilior around. The prefect of pages was a sharp article.

There was the clang of a military salute outside, and Diviciacus came in, looking sleepy and bad tempered. He came over to Anthony at once, embraced him formally, and said, "My dear Antoniades, I am so relieved to hear of your fortunate escape that I shall personally sacrifice a lamb to Jupiter the Preserver. Now, let's see what we have here . . . Great Hercules!"

"What's the matter?" asked Anthony.

"Do you know who this is? Its Aper Lucro in person!"

Anthony felt he ought to know what this meant, but he didn't, so he contented himself with looking astonished.

"The legate of Galerius' body-guard. This portends rebellion. I must alert the city cohorts at once and stop the northward transport of those body-guards. Excuse me, my dear Castrensis. I suggest you take up your journey as rapidly as possible. I will, of course, forward a report of this by imperial courier. Hercules send that we can control matters in Italy."

As he hurried out, Anthony gazed after him, frowning. There was something wrong in the picture of the Caesar Galerius who, as far as he himself knew, was about to marry Diocletian's daughter, starting a rebellion, and starting it by an attempt on the head of the military household. There was a screw loose somewhere. A big screw. The main thing was to get to Diocletian—and quickly!

XVII

AS THEY approached the camp, evidences of the incursion began to be-

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come visible in the form of burned-out farmhouses, and there were refugees camped by the roadside from Sabaria on. But that town had not been taken, and there was a general atmosphere of hope and cheerfulness among the officers there. They said that the Emperor had put out a strong cordon of infantry posts along the frontier, and the light cavalry, mainly Gothic and Numidian auxiliaries, were scouring the countryside for the wandering bands to which the Sarmatian host had been reduced. The town commander readily gave Anthony an escort of mounted archers and promised to send Felix Dextrippus and his men back with the next convoy of wounded. He had a pretty daughter from whom Berenice borrowed a couple of items for the obligatory formal presentation to the Divine Presence.

Along the road there was an occasional dead Sarmatian hanging from a tree. The main camp itself was pitched on one of the hills looking down on Vindobonum; very well kept up, with pickets properly posted, Anthony observed. This soldier-emperor knew his stuff. The challenge at the Praetorian gate brought out a young officer without his helmet who, when he saw Anthony's seal, said, "Oh, yes, the Castrensis. The Emperor is expecting you and said you were to be brought to him at once on arrival, but the woman is to remain here."

Anthony kissed Berenice, got out of the carriage and followed a soldier along the camp street to where, with two lictors standing stiffly at attention on either side of the entrance and a small gold statue of Hercules on a pole, the imperial tent stood. An officer took his name in, came back and held the flap ajar.

Anthony stepped forward, ducked and straightened up. Across the tent, beside a table that held parchments, sat the Emperor Diocletian, and opposite him was the Grand Chamberlain Anfidius Cappodolaris.

It was more astonishment than unconscious memory of what was proper that made Anthony go down in the prostration and kiss the hem of the imperial garment.

"Get up, get up," said the Emperor. "These obeisances are necessary to impress the barbarians, but we are Romans, and there's too much business to be done to waste time on ceremonies."

Seen near at hand, he looked only a little older than the public statues; a big-headed man, bald in front and with hair down to his ears elsewhere, strong, full lips, quick eyes and an expression of decision. No wonder he had achieved the miracle of restoring the empire.

He said, "Sit down. Anfidius has just been telling me about your reasons for not wishing Galerius to marry my daughter and become my heir. I own that his attempt to have you assassinated is a very serious matter, but that alone does not prove him lacking in imperial quality. I have had to remove one or two persons myself. Have you any better reason for preferring Constantius?"

Anthony said, "He has a son."

"Even if your theory of succession in the family is correct, which I am not fully prepared to admit, Valeria might bear one to Galerius."

Anthony pondered. He could visualize the world from which he came clearly enough, but its history ran back only a little way before encountering a kind of shining mist. Yet in that other world, surely there had been no temples to Hercules and many churches devoted to Christ. He said, "There is another and stronger reason. While still in Rome, I learned something of importance. Constantius' son Constantine is thinking of becoming a Christian, and by bringing him into the succession, you would gain their support."

"The Christians!" Diocletian leaned forward slightly. "Has Mercury stolen your wits? Why should I wish the support of that pernicious group of revolutionists? I have just been examining the records with a view to having them wiped out altogether."

"Nevertheless," said Anthony, "it remains a fact that more than a third of the population, especially in those eastern

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dioceses which Galerius now controls, are Christians. Why not win their revolutionary energies to fighting for the empire instead of against it? If Constantius and Constantine were in charge of the eastern dioceses, it could be done. They would come as recruits for the legions."

DIOCLETIAN said, "While I have never heard of so strange and indeed, well-nigh disordered a project, there is certainly nothing inherently more unreasonable about it than there is about employing barbarian auxiliaries in the army. It shall certainly receive my most careful consideration. Was this the reason you sought a personal audience? I warn you that it will be useless to try to influence me by arguments. I can't waste time listening to them."

"No," said Anthony boldly. "I brought with me a young lady I wish to marry. Due to certain complications I was forced to become her adoptive father, and I want to have the relationship changed."

"That will be easy," said Diocletian. "The Emperor is father of all his people. Kneel down and put your hands in mine."

Anthony did so. "Now deliver her to my charge," said Diocletian.

"I deliver to your charge my daughter Ausonia Berenice," said Anthony.

"Sutro!" called the Emperor. "I want it written down that I am giving my legal daughter—what was her name, anyway?—Ausonia Berenice—to the Castrensis Regulus Antoniades in marriage. Find them a Flamen of Jupiter. They are to be married at once." He turned to Anthony. "You may go. Gratitude will be expressed in actions."

Anfidius stood up to leave the tent with him. As they reached the door, he put a hand on Anthony's shoulder. "I am really most grateful to you," he said. "I think you may be accomplishing your mission, but I am quite certain you are accomplishing mine for me. Now he will adopt your plan and transfer Galerius to the West, where he can't make a Persian campaign. What the result of his failing to marry Valeria will be, I don't know. We haven't studied the resulting nexus in my home period."

"By the way," said Anthony, "merely as a matter of interest, what is your home period, and who are you when you're home?"

Anfidius smiled. "It doesn't matter in the least, since neither one of us is ever again going to get back where he came from, but I was originally known as Lin San Guptash, and my period is the 5926th year of the heavenly cycle. Our computers detected very unfavorable events about to occur to China as the result of the actions of a people occupying a continent a long distance from here, and it was necessary to go this deep in history in order to prevent them. This is the nexus."

"I don't think I understand," said Anthony, "except that I'd like to have you explain what you mean by our not being able to get back a little more clearly."

"As soon as the Emporer has implemented his decision about Galerius, both our perceptions will return to where we came from. But not exactly, since time is not a wheel but a spiral, and though much may remain the same, you will have crossed aeons in the process, and must live through the effect of the changes you introduced."

"But look here," said Anthony, "I knew you in New York—where I came from."

"Not me," said Anfidius. "Only someone who had the same physical form as the one I appear to wear, and something of the same relation to yourself. You must be an experienced time-traveller. The more frequently the trips are made, the more vigorously there is a recurrence of any personal problem you are faced with. Life is infinite, but one of its rules is the solution of problems, and the Infinity punishes attempts to avoid the problem by movement into another section of the time spiral."

"But I wasn't trying to avoid any problems!" cried Anthony, sincerely distressed.

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ANFIDIUS smiled his rather nasty smile again. "Weren't you?" he said. "You may not have thought so. But quite aside from whatever you intended to do in the past, there must have been some personal problem which you sought to solve by taking the time trip. It is always so with the inexperienced."

Anthony thought of the two Barbaras in the two New Yorks he would never see again, and why he had made the trips, and was silent.

Anfidius went on, "Be of good cheer. If you solve your problem for one sequence of the spiral you solve it for all—though you may find yourself faced with another."

"Okay," said Anthony. "Only I think you might have spared yourself the trouble of trying to have me killed, and even trying to take Berenice away from me. If you had let me go to Diocletian in the first place, he would have viewed the plan just as favorably."

"Oh, no," said Anfidius, "not at all. If it hadn't been for that attempt on your life at Placentia, the divine Diocletian would never have listened to anything that might lessen Galerius' importance. Now he feels he has to punish him somehow, without actually removing him as Caesar."

Anthony stopped in the camp street and turned on Anfidius. "Do you mean to say that you were behind that, too?" he said, feeling the itch to punch the man again.

"Certainly," said Anfidius. "Wasn't it a genial plan? It was bound to succeed—bound to succeed, no matter how the attempt came out. Of course, I knew you would make for the Emperor as soon as you left my villa, and when those cohorts of Galerius' bodyguard came through, I simply arranged things with Aper Lucro. I knew too much about him for him to refuse. If he killed you, you were out of the way; if he didn't, Galerius would get the blame. I think I should be congratulated, really."

"I think you should be crucified," said Anthony, "but just to gratify my curiosity, I'd like to know how you know I was coming through Placentia."

"I didn't. I had another little plan for you at Aquilea."

"I don't mean that. I mean how you knew Diocletian was up here in the north. As long as we're confessing, I may as well mention that I held up the dispatches so you'd think he was still in Egypt."

"That was ridiculous of you, ridiculous of you. Didn't I tell you that our technique is far beyond yours, and that I knew without anyone telling me that Diocletian was due to finish his campaign in Egypt and go to Pannonia?"

Anthony felt a sense of exasperation over the wasted effort he had put in on the imperial courier. "Well, good-bye," he said, "And if I never see you again, it will be too soon."

"Farewell," said Anfidius. "Solve your problem before it becomes a worse one."

He turned away as a young officer tapped Anthony on the shoulder and said, "It is the Emporer's will that you be married at once."

The altar was a camp altar in the open, and the Flamen of Jupiter was a young man, visibly disturbed over the fact that there was no white-thorn for proper bridal torches in this frontier land, and no proper threshold for Anthony to carry his bride over. Anthony solved the second difficulty by ranking a tribune out of his quarters and the first by declaring it unimportant, and with a group of strange officers as witnesses, the gathering was made.

Berenice looked strange and rather shy in a veil contrived for her from a merchant's piece of silk as the wife of one of the Vindobona garrison officers led her forward to be placed on a three-legged stool beside one on which Anthony sat, while the Flamen offered a soldier's rough cake on the altar and said the traditional prayers for bride and groom. A slave brought the cake to Anthony and Berenice, and each broke off a piece to eat it. Berenice placed her hand in his and spoke the ancient formula, "Where you are Caius I am Caia."

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They were married.

Flip!

THE helmet of the machine came off Anthony's head and he looked round. The furniture of the place had a distinctly exotic look, and the face of the Barbara who turned from the controls to confront him was unquestionably Chinese. A glance at the back of his hand showed that he was, too.

"I guess so," he said, getting up slowly from the seat of the machine, "only a little disoriented. Would you mind telling me exactly where we are, anyway?"

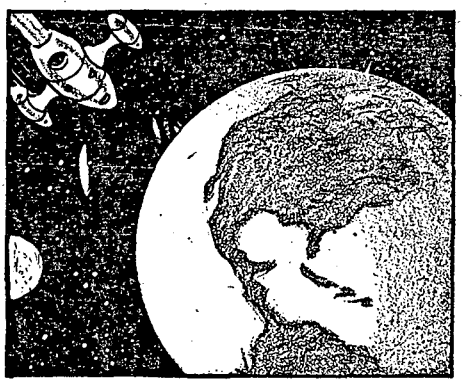
Her face showed a trace of anxiety. "Where but in the time laboratory of the University of Yuan in Li-Tsin? Come, look."

He followed her gesture to the window and in morning sunlight caught the familiar outlines of Central Park, only now it was filled with strange-looking Oriental trees and the tops of the buildings opposite were distinctly Chinese pagodas.

Lin San Guptash, or Anfidius, had won out after all. Galerius hadn't made his Persian campaign—but it was that campaign which kept the Orient from overwhelming the Empire before the young western nations could develop.

"Does it please you, my husband, to return?" said the new Barbara. "We must tell my father, who will be pleased also, that we have accomplished enough to be awarded red buttons."

"It pleases me, all right," said Anthony, "and I'm glad one problem is solved. But I wonder what the hell became of Christopher Columbus?"



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FINDERS KEEPERS

By MARGARET ST. CLAIR

It wasn't easy for Paula to have the last word. . . .

"EAT your mashed wattroes, darling," George said fondly. "They're good for you."

Obediently Paula prodded at the mess on her plate. Wattroes had many virtues: they were easy to tank-grow, easy to store, and they broke down into amino acids with singular ease in the digestive tract. But their flavors were nauseous, like that of very sweet hominy, and when they were mashed their bristly texture turned into a slimy mucilage. Paula hated them.

George was watching her. She scooped

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up two more blobs of wattroe with her chopsticks and swallowed them. They tasted as bad as she had thought they would. She pushed the plate from her and lit a cigarette to kill the wattroe-taste.

George frowned slightly. "Don't you think you're smoking too much, honey?" he said. "It makes you nervous. And besides, every cigarette is just that much more of a strain on the ship's air filtering system."

Paula snubbed her cigarette out in an ash tray. She exhaled in a sort of snort. She looked at George.

"Look here, George," she said, "why do you give me orders all the time?"

As always when a question was asked him, George considered. "Well," he said at last, "I love you. And I hate to see you do things wrong."

Paula snorted again. "Do things wrong? What makes you think I'd do them wrong if you stopped ordering me? For heaven's sake!" She looked darkly at her husband.

"Do you have any idea how many orders you give me in a day? You tell me how to clean my teeth when I get up, what to have for breakfast and how to eat it. You tell me what clothes to wear, and how much make-up. You even tell me how to do course computations, though I've got my junior astrogation certificate. About the only thing you *don't* tell me how to do is how to make love, and I suppose you just haven't thought of it yet. Why, when we were going through the asteroid belt and were standing watch for watch at the screens because it was so dangerous, you even—you actually had the nerve—to remind me to go to bed before I went up for my watch!"

"Thought you might overlook it," George mumbled.

". . . . For *God's* sake! You'll be tagging me in to see if I'm properly buttoned up next!"

George said nothing. Paula got up and walked around the cabin angrily. She was breathing hard. At last she sat down diagonally across from George.

"There's something I want to tell you," she said. "I suppose I ought to have told you before we were married, but we were busy getting the ship ready to hunt up the trove, and I just didn't think of it. I guess I never thought it would come up.—George, the psychologists who did my prime estimate told me that I have a potential dual personality."

"Dual personality?" George echoed absently. Paula didn't seem to know it, but she was sitting in a draught. Perhaps he ought to warn her. She might take cold.

"Yes, a dual personality. It's often associated with clairvoyance, you know. And—" she paused impressively—"and they were sure it was the transforming type."

GEORGE was silent. Paula said, "Haven't you ever heard of that?"

"H'um?" George rubbed his lip. "No, I don't think I have. There are so many things to know nowadays that no one person can have even a smattering of all of them. And I never have been much interested in psychology."

"I know you're not," Paula said rather grimly. "Well, the transforming type of dual—or multiple—personality is what lies at the bottom of the old stories about werewolves and weretigers and so on.—It's not limited to just those animals, of course—people can turn into anything. In an ordinary case of dual personality there is often a considerable physical change as one personality or another becomes uppermost. A little shy, modest woman will change into a big brazen huzzy and back again. But in the real transforming type the physical change is complete. It's an actual theriomorphism."

"You mean you may turn into another woman physically?"

"Not into another woman," Paula corrected. She sniffled. "Into an *animal*."

"Oh. Into what animal?"

Paula shook her head. "The psychologists didn't know. They were afraid to provoke the change because, though you can usually get back the first few times, each change makes the danger greater

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of getting permanently stuck in the animal form. They just didn't have any idea what form I might take. But they warned me to be careful."

"What's the mechanism of the transformation, though?"

Once more Paula shook her head. "It isn't thoroughly understood yet—or wasn't when I was interested in it. They know there's a—they call it a transforming dynamic—involved and the gross chemistry of the changes is fairly well understood.

"If a man's secondary personality is a cat, for instance, when he transforms free oxygen is released, and there's a heavy deposit of sugar crystals, or starch granules, on his fur. That's because a cat is much smaller than a man. But if he transformed into a tiger, he'd have to take up oxygen and starch, or sugar, from his environment. A tiger is bigger than a man, and the extra tiger tissue would have to come from somewhere. You don't get something for nothing, even in theriomorphism."

He grunted noncommittally. "But don't you see, George? I'm scared. The psychologists warned me to guard against prolonged nervous strain or anxiety. It's the metabolic changes during stress that trigger the transforming dynamic. If you keep on needling me . . . . you don't know how your ordering me around makes me feel! You wouldn't want me to change into a wolf, would you?" She tried to smile.

George got up from where he was sitting and came over to her. He embraced her tenderly. "Poor little thing! I'm sorry you've been worrying. Just take it easy, honey, don't get excited, and everything will be all right. There must be lots of people who have potential dual personalities and who never make the change."

"Yes, but you've got to stop ordering me around."

"Oh, sure." He hugged her again.

Paula allowed herself to be kissed. After the third kiss she turned her head to one side and sneezed. George said, in a solicitous tone, "Honey, don't you think you'd better move? There's a draught around that chair."

After a moment Paula got up and obeyed him, a peculiar expression on her face.

DURING the next few days Paula was quiet and remote, though she had a tendency to overset pitches and drop plates. The ship touched at Lladros, at Perbert, at Gwynton, at Glath. Glath was the last port before they went out into the other side of the asteroid belt, and Paula and her husband spent several days there checking over the condition of their ship and getting in supplies.

Ennalis was still a long way ahead of them, and they didn't know how long a stay they might have to make there. They might find the Eunnalid trove in a day, or a week, or a couple of months, or they might never find it at all.

Glath, an arti-grav planetoid, was a dull little place except for its excellent port facilities. On the third day Paula, who did not take the passionate interest in seeing supplies being loaded on the *Jasper II* that George did, began to get rather bored.

She shopped for curios in the stores that ringed the port, stopped in a bar or two to sample the local liquor, and wound up sitting in the park under the potted cycads and yawning until her jaws ached. At last, in a desperation of ennui, she strolled by the local post office and asked whether any letters had come for George or Paula Farnsworth.

To her amazement, the file clerk handed her three envelopes. The writing on them was a little fuzzy, for all of them had reached Garth by matter transmitter; but all three were addressed in the same hand—a big, sprawling, sloppy woman's hand—and all three were unmistakably addressed to George Farnsworth, Esquire, General Delivery, Glath.

Who could have sent them? Paula took the envelopes from the file clerk and walked back toward the *Jasper II*. It wasn't any of her business, but—

George was standing near one of the hatches, directing the installation of a

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tank of nutrient solution. She handed the envelopes to him. "For you," she said.

"For me?" His forehead wrinkled up. He examined the letters one by one, carefully. "Who could be sending me letters? Nobody knew we were coming here."

Paula shrugged. "I don't know. I imagine the best way of finding out would be to open them." She carefully turned her back while he tore open the envelopes.

"Oh," she heard. There was a silence, and then another soft, surprised, "Oh."

Paula could stand it no longer. She whirled around. "Who sent them?" she asked.

George shook his head. His brow was still wrinkled up; surprise always gave him a stupid expression. "This is very strange," he said. "I don't understand it—no, robby," (this to one of the Glath robot stevedores), "put the wattroes over *here*—as I was saying, it's odd. I don't understand it. Look." He held out the contents of the envelopes for Paula to see.

They were all three greeting cards of a sort. That is, they were the cheap, garish sort of card which the purchaser could design and emboss for himself in the automatic coffin-size "studios" that you found in most ports. The cards were strictly quarter-arcade stuff.

The first card said.

"Don't you wish you knew?
Your Secret Pal, that's who!"

The second read,

"I'm really on the way!
You'll find me some day!"

And the legend on the third ran:

"I may be big
And I may be rough
But I bet that you'll say
I'm quite enough!"

The signature printed on all three cards in glowing red and black ink, was "Your Secret Pal."

"Who could have sent me cards like that?" George demanded. "We don't know anybody who would send that sort of thing. And besides, nobody knew we were coming to Glath."

Paula shrugged. "I can't imagine."

George studied her. "Look here, honey, you're not, unh, sore, are you? Because I got mail like that?"

"No. You wouldn't even have known they were there if I hadn't happened to stop in at the post office. I just wonder who sent them, that's all."

"Good. I mean, I'm glad it doesn't bother you. You look tired, though, honey. Don't you think you'd better go in the ship and lie down?"

After a moment Paula turned and went in the ship.

IT WAS a little after one the next morning when she woke George by shaking him.

"I know who sent those cards," she said.

George, always a slow awakener, looked at her with his mouth open until she picked up the alarm clock, worked the lever on it around to one five, and hit him in the face with the stimu-spray. Then he said, "What?"

"I said, I know who sent you those cards."

"Who? Mavis?"

"Who's Mavis? No, she didn't send them, whoever she is. I sent those cards."

"You sent them?" George swung his feet around over the edge of his bunk and sat up. "What makes you think that?"

"Look at the post marks." Paula picked up the cards from the taboret and handed them to him. "They're blurred, but you can make it out. They were mailed, one each, in LLadros, Perbert, and Gwynton, just the ports we touched at, and the dates coincide."

"Yes, but—"

"I didn't tell you, George, but I had a—a sort of pop-off in Perbert. I was walking along one street toward the ship, and the next thing I knew I was on another street, going in the opposite direction. I can't quite remember, but I think the same thing happened in Lladros and Gwynton. That must have been when I got the cards—I've been having the most horrible dreams."

George was examining the envelopes

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closely. "I suppose that could be your writing," he said at last. "If you were writing from the shoulder, and your movements weren't any too well co-ordinated. The G's and E's look like the way you make them. But why did you send the cards?"

Paula had sat down beside George on the bunk. Now she shuddered. "I—oh, I'm so scared. I told you I had been having awful dreams. It's my secondary personality getting ready to show up."

"I don't understand what you're driving at," George said. He put his arm around her.

"Read the cards," Paula answered. "Don't you see what they say? 'I'm really on the way'—'I may be big and I may be rough'—some big awful thing is coming. It's my animal personality!" She began to cry.

"But—do you have any idea what animal?"

"Yes. Yes I do. Yes." She drew away from him and hid her face in the pillow.

Gently George pried her loose from the pillow and drew her up against his shoulder. "What animal, honey? Don't you think you'd better tell me? Is it what you've been having the dreams about?"

"I—yes." She pulled away from him and faced him. "I keep dreaming I've turned into a dinosaur," she said deliberately, "a great big animal out of the past, weighing tons and tons. It's awful, being buried alive in that thing. Its eyes don't focus and it moves about an inch a minute. And—and—I'm afraid that after I've turned into it I'll either step on you or eat you up."

"A dinosaur," George repeated. He rubbed his chin, which had begun to bristle. "Well, I suppose there's no real reason why an animal personality would have to be a modern animal. . . .

"What kind of a dinosaur is it, honey? Has it teeth like daggers, about six inches long, and does it walk on its hind legs? That would be tyrannosaurus."

PAULA shook her head. "No, it's what the average person thinks of when you say 'dinosaur.' It has a small head, a long neck, an enormous egg-shaped body, and four thick legs, like columns. Oh, I *hate* it so!"

"Has it got a long stringy tail? If it has, it's diplodocus. You didn't say anything about the tail."

"Its tail tapers gradually, but it isn't stringy."

"Probably apatosaurus. If it's apatosaurus, honey, you needn't worry about eating me. Apatosaurus never ate anything except rushes and marsh grass."

Paula was crying quietly. "It makes me so unhappy," she said dispiritedly. "Tyrannosaurus or apatosaurus—what difference does it make? I'm afraid that if once I change, I'll get stuck in the animal. I'll never get back."

"Poor baby. Poor little thing."

"And—and—even if you don't care anything about me, and aren't worried that I'll eat you up, how will you find the Eunnalid treasure without me to help you? You've said over and over that the map, without a clairvoyant to supplement it, would be useless. Earth people have been hunting the Eunnalid trove for over [illegible] hundred years, and nobody has found even a trace of it.

"Won't you please stop needling me, George? It's serious. I worry about it all the time. Even if you don't care anything about me, think of the trove!"

"I care a lot about you, honey," George said. " . . . And you really think that the nervous strain caused by my, unh, needling you may make you turn into a dinosaur?"

"I *know* it will," Paula said simply. She pulled up the edge of the sheet and dried her eyes on it. "I'm so scared."

George embraced her fiercely. "I'm scared too," he said solemnly. "So help me God, I'll stop needling you. I mean it. I promise. I'll never needle you again. I don't know why I do it anyhow. It's just nervousness."

" . . . . That will be wonderful."

For a long time they clung together. Gradually Paula's sobs quieted. The embrace in which she held George had in

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it more affection and less desperation. She began to smile.

George, too, was feeling a change of temperature. "You know, honey," he said in a less solemn, more ordinary voice, "I've been thinking. I don't doubt my needling worries you, but don't you think other things could contribute to nervous strain?

"For example, you don't get enough sleep. You ought to rest more. You're awfully thin—you smoke too much and you don't eat enough. I was watching you last night. You hardly touched your wattroes. Don't you think you ought to eat all the wattroes on your plate?"

Paula tore herself away from him. She jumped to her feet. Her eyes were blazing. "If you say that once more," she said passionately, "I'll divorce you. I won't stand it. Do I have to be turned into a dinosaur or some horrible monster just because you like to give orders?

"I won't stand for it. You're driving me crazy. You're turning me into a dinosaur. You're spoiling my clairvoyancy. You're driving me mad."

SHE put her head down and howled. When George came up and tried to pet her, she kicked him as hard as she could on the shin with her bare feet, and fled. When he followed her into the galley, she kicked him again.

None the less, her outburst seemed to have done some good. During the next ten days or so George made a genuine effort to hold his hand. The *Jasper II* left Glath, passed Eschaton, and reached the beginning of the asteroid belt without his having made a single suggestion or given a single command, and this even though Paula had handled the course computations. She had looked forward to the passage through the belt with dread, but she needn't have; far from reminding her to go to the head, George did not even tell her to be sure her air hose was connected. By the time the ship had got through the asteroid belt, Paula had begun to relax. Her face was less tense and her eyes had lost their harassed look.

George was calmer too. He had found that if, every time he felt inclined to make a suggestion to Paula he told her something about the Eunnalid trove instead, it worked pretty well. The consequence was that long before they picked up Ennalis in the viewers she knew as much about the trove as he did.

Ennalis is a chunk of rock about eighty miles in diameter, situated on the extreme outer edge of the asteroid belt. Of no natural interest or importance in itself, yet it has been the object of the passionate interest of generations of treasure seekers because it was once the religious center of the fabulous Eunnalid confederacy.

As soon as earth people got outside the solar system they began to hear stories about the Eunnalid confederacy—about its wealth, its power, its overwhelming artistic pre-eminence. The stories, judging from the remains that have been found, rather understate things. And Ennalis was the religious center of the Eunnalid confederacy.

Each year each of the member states was required to make an offering of the best that it had—an art treasure, distinguished for beauty, for inherent value, for workmanship—at Ennalis (Ennalis had an efficiently-functioning arti-grav system then, and considerably more atmosphere than it has at the present day). Once every hundred years the ruling Eunnalid king went through the offerings and selected the one that he considered the most choice of all that had been offered in the century. This unique treasure was then dedicated, with great ceremony, to the tutelary divinity of the confederacy, Fortune That Preserves. And the resultant accumulation of these centenary treasures over several millenia constitutes what has come to be known as the Eunnalid trove. No wonder treasure seekers have always been interested in Ennalis.

George, like a lot of other people, had been interested in the planetoid. He had listened to stories, collected rumors, read books. His interest had become more definite after he had bought, for a couple

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of drinks and all the money in his pockets, a map of Ennalis that the seller, a disappointed treasure-seeker, had bitterly insisted was no damn good. But it was not until he had met Paula, fallen for her, and learned that she was clairvoyant, that he had had his big idea.

ENNALIS is all ruins; ruins and rocks. George set the *Jasper II* down in the only clear space he had been able to locate from the air, a paved temenos in front of the Gallery of Fortune. It was only a few miles from the place they were hunting, and walking would be easy in the weak gravity. Then he and Paula got into space suits—the atmosphere on Ennalis is thin—slung shovels about their waists, and started on their trek. George was trundling a self-powered dredger-spade in front of him.

The selfishness of generations of treasure-seekers has left a palimpsest of ditches over most of Ennalis; everything has been disturbed; archaeologists curse when the name of the planetoid is mentioned. On the first day George and Paula dug where the man who had sold George the map had dug. A number of other people had dug there before them. On the second day they dug *around* the spots of the first day's digging. On the third day they dug according to hunches, usually supplied by George. On the fourth day, more of the same. On the fifth day, Paula called a halt.

"It's not here," she said after they had been digging for two or three hours. "We're wasting our time. It's not on Ennalis."

"The trove?"

"Yes."

"But it's always been supposed to be here—how do you know?"

"I can see its not being here."

"Well, I guess a clairvoyant could. But where is it, then?"

"Out there." She made a gesture that described the plane of the asteroid belt they had come through on their way to Ennalis. "It's on one of the asteroids."

George drew several short, quick breaths. "Honey, can you tell which one?"

Paula shook her head. "No. Nobody could. The best clairvoyant in the world couldn't. It's worse than hunting a needle in a haystack. There's too much stuff in the way."

There was a silence. Then George sighed. " . . . . I guess we might as well think about starting for home."

"Yes—wait a minute, George. Let me think." She sat down on one of the mounds of earth. "It was here once," she said musingly, "and they sent it away because the confederacy was beginning to break up. They thought the trove might be in danger. But they'd want to be able to get it back again, when times had improved. Get it back in a hurry. Now, how would they send it away?"

She was silent. George watched her intently, leaning on his shovel. Then she said, "There's still something here, George. I can tell that."

"Lesser treasures?" George asked hopefully.

"No, not that. It's—it feels like—the letters I sent. From the different ports, you know. Now, what could there be in common between those cards and something on Ennalis?" She chewed her lip thoughtfully, her head drooping.

GEORGE'S hands clenched on the shovel. He was almost too absorbed to remember to breathe. At last Paula raised her head. "It's a matter transmitter," she said almost briskly. "That's what the Eunnalid trove and the cards I sent have in common. They used the matter transmitter to send the trove to the asteroid. Then they took the transmitter to pieces and buried the pieces. But some of the pieces are still here."

She got up from the mound where she had been sitting, and began to scrabble in the dirt with her gloved fingers. She dug down about six inches before she came up with a wishbone shaped piece of very light silvery metal. "This is part of it."

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George took it from her and examined it. "I don't recognize—oh, yes I do. This is a part of the scanning beam mechanism. It ought to hold a mirror in the fork. Listen, baby, do you know where any other pieces are?"

"Well, there's one there . . . and one there . . . . and one over there." She pointed. George set the shovel where she indicated, and began to dig.

Ennalis, because of its small size, rotates rapidly. The third of its days, for that day, was drawing to a close when George fitted the last piece of the Eunnalid matter transmitter in place. "There," he said.

Paula looked at it foggily. She was feeling extra-ordinarily tired. "Will it work?" she asked. "After all these years?"

"I don't know why not," George answered. "There's only one setting possible, and it's razor-sharp. They didn't want to risk having the trove come back a little hazy and off-focus. As far as power goes, it probably ran on uranium salts.

"The best way to find out is to try it. Let's see, now. Umm. . . . there."

The Eunnalid trove was at their feet. There was an absolute simultaneity about it; it did not appear an instant after George turned the switch, or a fraction of an instant, or a fraction of a fraction of an instant later. It was there, at their feet.

"Oh," Paula sighed. She sank on her knees in front of it.

Her earlier fatigue had been replaced by an intense—an almost painfully intense—happiness. It was not that she and George would be rich, though they certainly would. It was not that they would be famous, though from now on their names were in the history books. It was not even that their eyes were the first, in more than two thousand years, to look upon the Eunnalid trove. It was —it was—

"Oh," she said once more. She held out her hand to it.

George turned a beaming face on her. "Do you realize what this means, honey?" he demanded. "Do you realize that we've found—*we've* found—the Eunnalid trove! It's wonderful! I knew you were a good clairvoyant, but I never knew you had anything up your sleeve like this!

"And it's beautiful. Lord, it's beautiful. Worth a lot of money too. All the museums . . . we'll be rich."

"Yes," Paula answered.

SOMETHING in her tone caught George's attention despite his excitement. He switched on the torch and held her impaled in the beam from it. "Just as I thought. You're all worn out," he announced. "Honey, don't you think you'd better go back to the ship?"

Paula held out her hands again to the trove. It seemed to her that a radiance that was not quite of the senses was trembling around it. "I don't want to go back to the ship. I want to stay here. With the trove."

George fidgeted. "Yes, but, honey, it's getting dark. Pretty soon you won't be able to see the trove anyway. Don't you think you'd better go back?"

"No. Stop it, George."

"Well . . . . " He brightened. "I know, I'll fix the torches so you can see the trove no matter how dark it gets." He fussed with the torches, propping them up at various angles and changing the focus on the beams, until they satisfied him. "There. Lord, it's beautiful. I certainly am excited. I feel like yelling or giving three cheers.

"Listen, honey, it's been a long time since morning. Are you getting uncomfortable? I mean, did you remember to go to—"

Paula turned and looked at him.

Something in the look made George realize what he had done. "I forgot," he said helplessly. "I'm sorry. I was excited. I forgot."

Paula said nothing. At his last words an intense pain had gone through her skull. It felt as if somebody had chopped into it with an axe made of light. She moaned. She put her hands up to her head.

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The pain withdrew. For a moment nothing happened. Then Paula's brain seemed to expand and grow dark.

She had a sense of masses of packed and yet ghostly flesh pressing in upon her. It seemed to arch above her in a static wave. She was stifling, she was being immured, she was being buried alive in it. She—the person called Paula—was being overwhelmed by ton upon ton of sodden, clammy, unresponsive reptilian flesh.

She uttered a muffled, desperate sob. She made a pushing motion with her hands. She didn't want—she passionately didn't want—to become a dinosaur. Her whole being rejected it.

The transformation failed at the last moment. Partly it failed because of the intensity of Paula's resistance, but mainly because there was at hand no adequate supply of oxygen, and starch or sugar, upon which a transformation into a dinosaur could be based.

There was a sense of something hovering, enormous and suspended, in the air. For a second anything at all was possible. Then it seemed to withdraw. The transforming dynamic, in default of oxygen, sugar, or starch, had fastened upon someone else. It had fastened upon George.

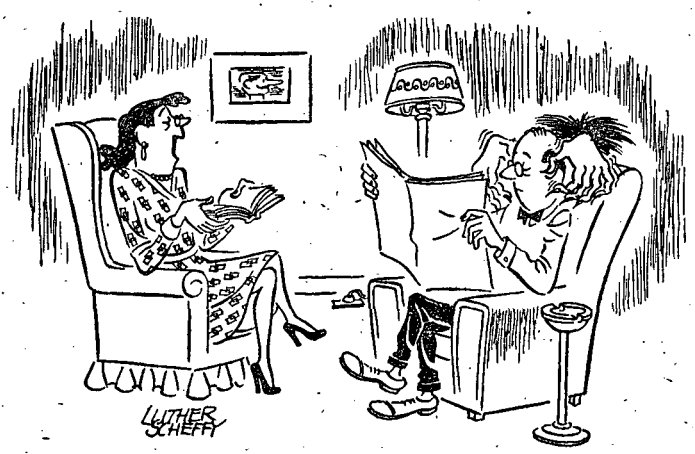
It took Paula a while to realize what had happened. The event she had expected was so different from what had actually occurred that she was dazed and benumbed. She looked at George, who was sitting on a rock, surrounded by a heavy circle of white crystalline grains, unbelievingly. She opened her helmet cautiously and touched some of the white powder to her tongue. It was sweet. She began to cry.

She cried for a long time. At last she stopped crying. She looked at the *Jasper II* thoughtfully. It was a well-designed ship, though a little large for one person to handle, and she had plenty of supplies. She could get home all right.

The Eunnalid trove was another problem, but she could decide what to do about it later. If she couldn't think of a plausible story to account for it, she could always send it back.

Once more Paula looked at George. He was still sitting on the rock, but he had begun to move up and down, doing push-ups, in the curious way that lizards have. The sun was coming up for the fourth time that day; when it was in the middle of the heavens again, the temperature among the rocks would be rather high, though perhaps not too high for a lizard. Still . . . .

Paula addressed her quondam husband. Her voice was pleasant, and her lips wore a not unkindly smile. "Why don't you crawl under a rock, George? Wouldn't that be better?" she said.



"Let me know when you come to a good stopping place. I want to tell you something . . ."

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STORMY WEATHER

By JUDITH MERRIL

Since my guy an' I ain't together
Keeps rainin' all the time . . .

THE TIME . . . For three days Cathy had watched and waited. Three days: measured in Earth-hours by creeping hands around the smug face of the chrono overhead; measured in mood and majesty by the slow progress of the dark ball of the Earth across the distant bright face of the sun.

Three days: twelve meals out of the freeze chest, duly warmed and eaten, but untasted; as many snatches at brief sleep that gave no rest; eighteen loggings of the instruments, checking new readings against prediction data from the analog. Three days: four thousand, three hundred and twenty minutes; how many seconds?

She could figure that out, but she couldn't, wouldn't, count the times she'd tried to call him. Or the endless stretches in between, waiting for him to call.

Where are you now? her need cried out within her. *Darling, I love you!*

How could he possibly not hear?

Mike! How could you go away?

She wouldn't call again. Not yet. Cathy moved restlessly under the magneblanket in her bunk, and wide awake in her renewed determination, sat bolt upright and peeled herself out of its comfortless clutches. She pushed off from the metal frame, barefoot, and floated in aimless circuit of her small domain: one round room, three full lengths of her body in diameter; a tiptoe stretch,

She had to send her searching mind to hunt through space . . . for a guy who might not want her. . .

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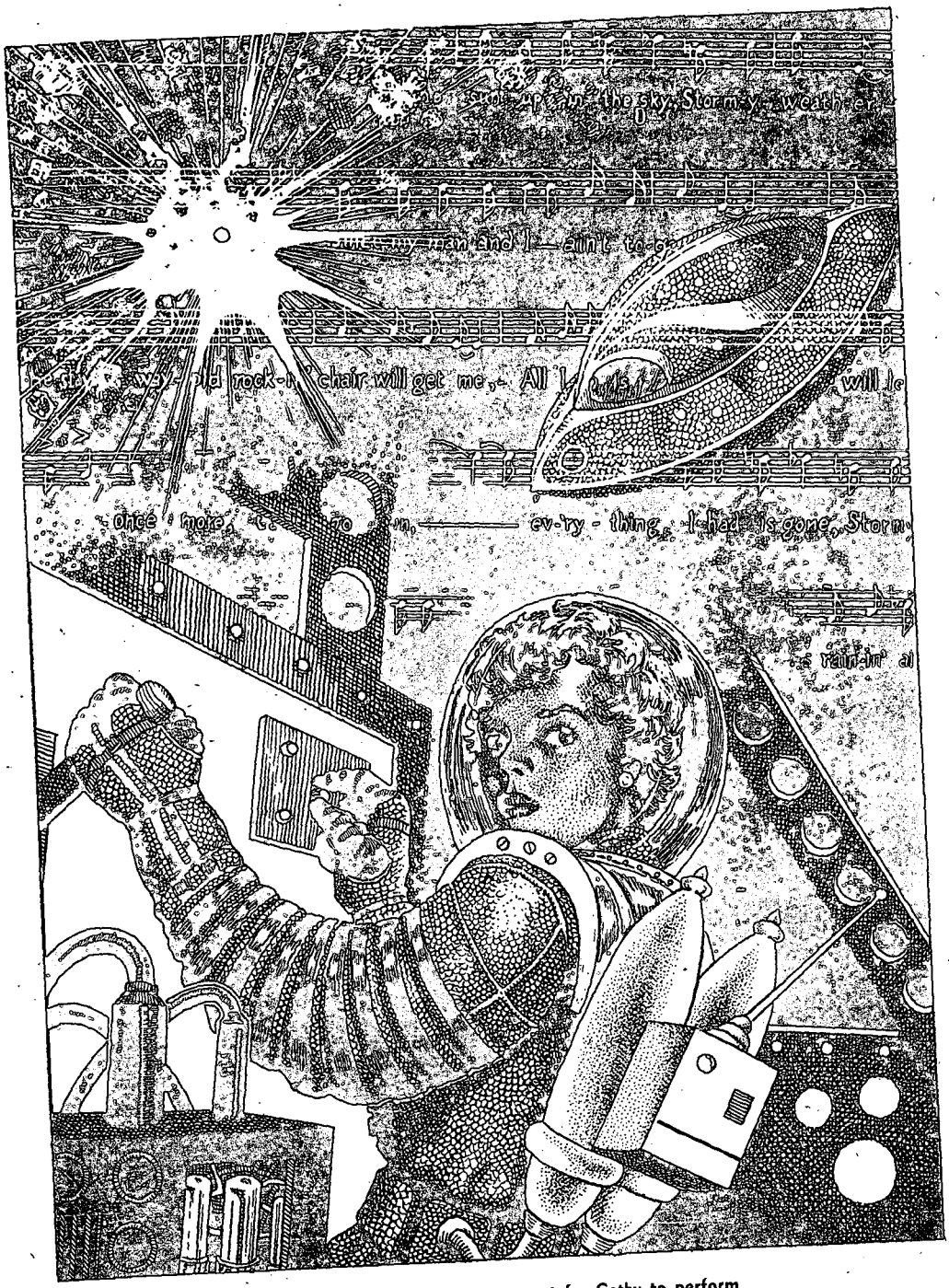
Storm's a-brew-in' up in the sky. Stormy weath-er,
Ain't no-thin' I can do 'bout it, And I ain't got
Ma rock-in' chair will get me. All I
will be
once more, Cathy a-lone, ev-ry-thing I had is gone. Storm
's rain-in' a

There remained just one more act for Cathy to perform

Illustration by PETER POULTON

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with arms upraised, from the light magnetism that held her metal-seeded sandals on the "floor" to the "ceiling" bulkhead that separated the living quarters here from the storage compartment "above."

She *wouldn't* call again. She couldn't afford to.

On the ceiling, near the chrono, a green bulb glowed, had glowed for three full periods now, twelve hours, to remind her that the tiny universe was rapidly becoming a closed system. The bulb went on when the u-v's did, as soon as solar radiation on the algae-air tank fell below full-activity point. It would keep burning, tingeing the round room faintly green, as long as the lamps kept working on the tanks outside. Beside the bulb, green numerals glared from a pale, violet-hued panel, offering the current index activity in the tank:

89.593.

She couldn't afford to use up oxygen now for anything but real necessities. And even if you stretched a psychological point to call this need essential, it was insane to draw on her reserves of air and heat both, trying to send a message he wouldn't even answer.

Wouldn't answer . . . All right, then keep the small reserves until *he* wants to call. That would be funny, wouldn't it? *Hilarious!* If he tried to call later, and she'd run her air too low by calling him to be able to answer. . . .

Cathy tried to laugh at such absurdity, and found the humor of it was beyond her.

Serve him right!

The thought shocked her; she hadn't realized how angry she was beneath the doubt and worry. Just the same, she told herself, still trying to be funny, she didn't have to use up all her oxygen and power now just to make sure she *didn't* answer when he—*if* he— called.

Besides, it might be useful to be able to answer a call from Control Central—or even *make* one if she had to. That's what they were paying her for, after all.

Eat; that's the thing to do. Time, and past time for a meal. *One message equals two meals.* She told herself primly in training-school sing-song.

Only she wasn't hungry.

"Ping!" The chrono chime startled her. She hadn't realized it was so late. "Instrument check," it reminded her softly. "1200 hours. Instrument check." Louder now: "Instrum—"

She switched it off in midword. They were paying her for this too, she thought without interest, and reset the alarm for 1600 hours. She pushed off in the direction of the bunk and slid her feet into her sandals; began a slow, walking-circuit of the room, logging the meter readings, resetting dials and controls.

Her mind was made up now. She would not—repeat, and underline, *would not*—make any effort to call Mike during the next period. After the 1600 check she could try again—once.

ALL quiet. All correct. Cathy fed her readings into the calcker, pulled a fresh tape out of the analog computer, and fed that data too into the softly whirring machine for swift comparison, knowing beforehand what the results would be. Everything checked well within the margin. She noted the minor variations meticulously on the analog corrector, reset the alarm systems, and checked her mental picture visually on the radar screen.

Everything in its place. A few tidy little asteroids, chasing their orbits around the vanishing sun, just as trim and true as the course of her own hollow cylinder of metal. Plenty of traffic to log, of course, but none to worry about. She was less than a million miles out from Earth now, and at that distance, Control Central still handled the live traffic.

All quiet . . . Bound to be quiet here, on the sunside swing of the Station's "rogue" orbit. A few more days, and she'd be inside Earth, slanting steadily "down" from the ecliptic, headed for perihilion just outside Venus. But by the time that happened, she wouldn't be aboard.

Just five more days to this tour. A week's time—one short week, if you

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looked at it that way, and she'd be back on Earth, while the station whirled on under the care of a pleasant-looking blonde girl named Eileen whose height and weight and basal metabolism rate were just the same as Cathy's, and who, fortunately, liked the same music and films. More than that they were unlikely to know about each other ever—or at least not while they were both in Service.

Thirty days on, thirty off. A great life if you could take it. The pay was good. The food was better than you might think. If you didn't mind no gravity, or solitude. The living conditions were pleasant enough, once you had your own permanent Station, especially if your alternate had somewhat the same tastes you did. Bring out a few replacements each new trip for reading and amusement; and find the changes made in your absence as well.

Five years of it, and you were set for life. Not that you could save much in Service—too much temptation to spend when you were Earthside. But besides the retirement pay, which was good, there were always jobs waiting for the glamorous heroes and heroines of the Space Service; and the best jobs of all were for the expert psichosomanticists who womanned—or manned—the Stations.

Cathy had almost four years of it behind her now. Seven more tours to retirement—and they'd both agreed it was foolish for her to quit. They could spend almost half the time together anyhow; and with both of them p-s-trained, no more was necessary. They could always keep in message-touch.

That's what they told each other, sanely, sensibly, after twenty days of wonder and enchantment back on Earth. No, not twenty, she reminded herself: nineteen. There was one day when they quarreled. . . .

That was even worse than now. That time she'd *known* his absence was angry and deliberate. Now she could find excuses, invent reasons . . . *drunk? . . . doped? . . . dead? . . .* she asked herself brutally, marvelling that she found these answers easier to contemplate than anger or indifference.

Because I don't believe them, she realized ruefully. But what other reasons could there be?

Pride. His foolish pride! Or just hard work? Something top-secret so he couldn't even let *her* know? Or. . . .

Sure, lots of reasons she could find, but none—the last included—that could make him just *walk out* without warning as he'd done. Unless the dream had been a warning after all: the scream in the dream that woke her from a period's sleep three long days back, just as the Station entered the penumbra of eclipse. He'd been gone when she came frightened-wide-awake that time; and she hadn't been able to reach him since.

THE coincidence was tempting, but she knew better. It *couldn't* be because of the eclipse. If it took radiating energy to message with, no one would ever be able to contact Earth from the outer Stations. . . .

Still, there might be something special about *this* eclipse. Some by-effect, some related phenomenon she didn't know about. It was also quite true that she hadn't heard from Control Central since she entered the shadow. Hadn't tried to call them either. She could try now, of course, and then she'd *know.* But if she *didn't* try, she could keep the illusory comfort in her mind; a feeble sort of straw to cling to; but in the absence of anything more solid, she hesitated to let it go.

Besides, it was just as wasteful to make an unnecessary call to Control as to Mike. *One message equals two meals.*

Oxy at 88.974. *One meal equals two cigarettes.* And she still wasn't hungry.

Ought to sleep then. She was afraid to sleep. . . .

Read a good film then. She didn't feel like reading. She wanted a cigarette.

Four cigarettes is one message. *A message is only a message but a good cigarette is a smoke.* Where did that come from?

And where are you now, my darling?

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Mike! Please, Mike. . . .

Sharply, she cut off the thought, and beneath it ran the thread of lonely melody again.

Gloom an' misery everywhere . . . Since my man an' I. . . .

Cathy reached over to the calcker and fingered the roll of tape that wound out of its answend, as if she could find with her fingers some piece of information that her eyes missed when she read it through before. Something, maybe to tell her why Mike and the sun had gone away together.

But the calcker didn't know about Mike. If she asked it, *Where is he now? Why won't he answer me?* it would buzz and click unevenly, and in the end tap out one terse rebuking symbol on the tape: Insufficient data.

Well, that was her problem, too. A scream in a dream, and the shadow of the sun; that was all she had to work with. Plenty of data about everything else, though: a wall full of it all around her, and a roll of it, neatly digested, right in her hand.

And the warning on the ceiling: *88.899.*

You don't take chances on a Station!

One cigarette, that's all, she promised herself. After all, she'd missed a meal. It was taking more of a chance, really, getting into this kind of state than using the extra little bit of air and heat.

Algae's not at top efficiency, but neither am I. Go ahead; pamper yourself a little. Better to have it now while the tank's still fairly high, still getting some solarays. If you're still wanting it tomorrow, you'll just be out of luck. . . .

CATHY kicked off her sandals, and floated over to her personal storage cabinet. She got out a cigarette, hesitated, and, holding it, made a quick automatic check of radar screen and indicator dials. No change; with everything quiet outside, she could watch for a while. She threw a switch to open the sunward port, retrieved her shoes, and walked back across the room to a padded piece of bulkhead from which she could keep both screen and viewport comfortably within her angle of vision.

Curled up against the foampad on the "floor," her metal soles and metal-seeded tunic were enough to keep her "sitting," even if she moved a bit from time to time. It took some conscious effort of the muscles to pull free from the light magnetism of floor, chair, and bunk. Settled into a reasonable facsimilie of gravity-sitting, Cathy listened to purring of the motor fade away as the heavy metal hatch slid off the port, filling the room with deep-empurpled light.

If things go on this way, ole rockin' chair will get me. . . . With one long, angry inhalation she lit her cigarette. Then she relaxed, and watched the solar spectacle outside. Watched with an added guilty pleasure in her own delinquency through a thin veil of smoke that fanned out from the tip of fire in her fingers to the wide slits of air ducts round the room. . . .

She had watched at least a little while each day since it began. First a wedge of darkness, nothing more, nudging into the edge of the sun. Then a round black mallet squeezed at the giant ball of butter floating in fluid ice of space: shaped it into a fat crescent, then a thin and thinner one.

This time she found an almost total sphere of darkness cuddled inside the scant embrace of a lopsided new-moon sun: one arm, on top, much longer than the bottom one, because of the Station's relative position "under" the plane of the ecliptic.

But even as she watched, the long skinny arm on top grew visibly shorter; less than five hours from now the Station's orbit would intersect and enter the umbra of Earth's shadow. The "total" eclipse would last, then, for a full day and a little more. Twenty-six hours, seventeen minutes, thirty-nine seconds, the calcker said, and the figures stuck in her head like symbols of doom.

No sun up in the sky! Stormy weather!

There would be only a few more hours after that, two periods at most, before

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the Station raced inward under Earth's orbit, moving faster and faster into the full light of the sun again. Three days gone, and less than two to go—but all that time the green index figure on the ceiling would be falling.

At 50%, oxy production in the tank was just about equal to basic minimum requirements for one Cathy-sized individual doing a predetermined job in a known volume of space, with no waste motion, and no other unnecessary expenditure of air. According to the tape, the index wasn't likely to go below 57.000 this time—if she was careful. And that of course assumed continuous effective operation by the notoriously unreliable u-v's.

Cathy looked up at the green figure on the ceiling:

88.215.

It was falling faster now. Abruptly, she squashed out the not-quite-finished cigarette. The margin was just too narrow to fool around with. If the index did fall to fifty, it would mean accelerating the Station, using storage fuel from the great tank "overhead" to get back into the sunlight more quickly.

AT THE other end of the Station's long elliptical orbit, in the inner circle of the Asteroid Belt, such a maneuver was inevitably dangerous, and very possibly fatal. Getting even slightly off-course at any time made the analog predictions useless, and following an uncharted course out in the Belt, you were likely as not to find yourself disputing the right-of-way with a stubborn chunk of rock.

Cathy sat huddled against the cushioned bulkhead, alone and miserable, weary and wakeful, frustrated and fearful. The vast expanse outside the viewport seemed to have borrowed her mood for coloring.

When he went away, the blues came in and met me. . . .

Suddenly, she leaned over to the right, reached for a dial, and spun it fiercely, adjusting the polarization of the port plastic to compensate for the change in quality and intensity of the sunlight. Three days drifting into the shadow, and she hadn't thought to do that before! Now the crescent sun flared into sudden brilliance, and the small room acquired an almost cheerful glare.

She was surprised at the difference it made; the purplish light had seemed normal and inevitable. *Stormy weather . . .* three days of it. No Mike. No light.

"Three days, that's all," she said out loud, trying to make it sound like just a little while. She'd gone twenty-five years after all without even knowing him. Now it was just three days since they'd lost contact. At worst, it was only another week before she be back on Earth herself, and could *find out.* One week . . . seven days; just seven brief eternities, that's all!

Time is a subjective phenomenon, she told herself. Time is a trick of the mind. "A purely personal psychological defense against dimensions beyond understanding. . . ." *Who was it who said that?* It seemed very profound. An instructor somewhere, maybe. . . .

Time is where you hang your hopes. At least nobody had said *that;* that was Cathy, herself, original. Time-past is flat and gone, no more than a set of impressions in the cells of a brain. *My brain.* Time-future is tomorrow. But tomorrow never comes. It's always today, the time is *now,* a composite of memory and hope and longing focussed on the pinpoint of perception that is *now. . . .*

Now is the time for all good Cathys to go to sleep. Got to sleep sometime. Close the hatch. Get in the bunk. Pull up the magneblanket . . . wonderful . . . good, good, *good* to be sleepy, relaxed . . .

"Alert for action. *Alert for action!* ALERT FOR ACTION."

The chrono speaker was louder and more incisive each time.

Cathy dived across the room to where two red bulbs glowed their warnings over agitated meter-needles. Quickly, reflectively, she fed new data into the

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calcker, ignoring the chrono speaker's increasingly urgent warnings till she could take time to switch it off. Then she hovered nervously over the whirring machine, waiting for the fresh tape to emerge, watching the radar screen beyond it for some sign of what the trouble might be.

Nothing there she didn't know about. Nothing but a little almost invisible interference fuzz in the far corner. Like windo tracks, or. . . .

She pulled at the tape as it began rolling out, and started it through the microfilm magnifier almost before there was enough length to let it ride the reel. Eagerly, she absorbed the steady stream of figures and symbols until, abruptly, everything fitted together, and the pattern was clear.

Just a little interference fuzz in one corner—a particloud! A mass of fragmentary rocks and pebbles, the debris of some unidentified catastrophe in space: perhaps a minor everyday collision in the Belt; perhaps some greater mishap farther out in the System; possibly though unlikely, a grand smashup between two extra-solar bodies light-years away.

IT DIDN'T matter now where the cloud of grit and gravel came from; it mattered very much where it was going. And it was headed straight *in*, irresistibly drawn by the gravitational pull of the giant incinerator at the heart of the System. A tidy way to clean up solar trash—except that at its present velocity, the drift was due to cross the busiest spacelanes in the System, just outside Earth's orbit, and perhaps—if it diffused at all under the pull of planetary gravity—brush through the very edges of the atmosphere.

Once more, Cathy checked the coordinates and velocity of the cloud, and then the Stations Catalogue. No doubt about it: it was her baby. No other Station anywhere in range, and she was almost directly in line between the oncoming drift and Control Central's satellite around Earth.

There was nothing very complex about the operation. Standard procedure was to release a fizz-jet from the storage bay; position it inside the cloud, and set it off; the whole job done at the remote control board, using co-ordinates and timing set forth with near-impossible precision on the calcker tape.

If it were done just so, the tiny particles of matter that composed the cloud would be reduced to powder fine enough to be *pushed* back, clear out of the System, by phonton-power alone. And any specks or pieces that remained big enough to continue to respond to the sun's gravity would be impelled by the bomburst to drift out sideways, perpendicularly away from the plane of the ecliptic; when they came floating back eventually, they'd be far out of the travelled space-lanes.

The operator's job was not so much difficult as delicate: a matter of steering the fizzer to its optimum placement, and then exploding it at the spit second laid down by the calcker's figuring. It took practiced skill and close co-ordination—but Cathy had done it before, and as she got the data from the tape, found nothing out of the ordinary in this storm beyond the edge of excitement provided by its imminent closeness to Earth.

She moved energetically now, logging data, settting up equations for the co-ordinates on the calcker, checking the analog, the screen, the dials and meters that belted her little world. When the call came through from Control Central twenty minutes after the first Alert, she registered it and replied without so much as a moment's delusion that it was Mike calling instead.

"Cath? Just checking. We got a particloud pattern on our screen in your sector."

"Yeah, I noticed."

"Everything under control?"

"I'm calcking the bomb-set now."

"How's it look from out there?"

What's the matter with them? Cathy wondered irritably, but kept her reactions out of her reply, or hoped she did. "S.O.P.," she answered tersely.

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"Right. Check in when you get your set?"

"Better not. I'm eclipsed." She glanced at the ceiling. "Oxy's under 85 now, and a long way to go."

"Sorry."

Cathy recognized the personal pattern of the girl on the other end now: a kid named Luellen, just a few months out of school. No wonder she was nervous; this would seem like a Big Thing to her.

"Nobody told me," Luellen explained. "I guess I should have figured it out—"

"Forget it!" Cathy sent back briskly.

"Okay. We won't call again then unless it's urgent."

"Good. Anything goes wrong. I can still signal."

"Right. Signing out. . . ." But before the contact was broken, another, more familiar pattern cut in. ". . . Hey, Cath —you okay?" That was Bea Landau; she and Cathy had been in training together, and there was no excuse for anyone who'd spent four years behind a desk at Control Central kibitzing a message at a time like this.

"Sure I'm okay. Why?" This time Cathy didn't bother to conceal her annoyance.

"I dunno. Got some funny stuff around the edges there—I'm supervising the new girls today, and I was listening in on you— Listen, Cath, if anything's wrong, this is the time to. . . ."

"*Nothing's* wrong. I just don't feel sociable. Get out, will you? I already said my oxy's low."

"Okay. But listen, Cath, if you want a hand, yell out."

"Sure. G'bye now."

DELIBERATELY, Cathy cut out of contact, and went back to work. But as the data piled up, she began to realize more fully that Control had some reason to be worried. This cloud wasn't just the usual nuisance that might clutter up the spaceways, and perhaps make a mess of repair-bills for somebody's Mars-ship. A whole lot of money, and probably plenty of Service brass, would be sitting around holding its breath right now, she thought with a certain relish.

Not that the job was actually a tough one. The cloud was coming in from outside and on top. Made it a simple matter to hit—the bomb would set practically smack in front of the middle of it.

Not a tough job, but a crucial one. Just what the doctor ordered, she thought grimly, for a girl who wanted to forget her own troubles.

It was almost too simple, though. Fifteen minutes more or less had all the figuring finished, and everything checked and rechecked. Nothing else to do about it now till the cloud came into range, and by the tape it would be close to five hours yet before any action began.

Meantime, the space around her was clear and quiet. She opened the viewport again, and settled back into the foam-padded spot on the floor, consciously seeking a renewal of the pleasant apathy that had come last time, after she adjusted the plastic to let the sun come in.

But the mood was hard to find again. Part of her mind was busily retabulating the calckers figures, and re-evaluating the total problem, making certain of what needed to be done. For the rest, she was aware of an increasing sense of dullness, and irritability as the good adrenal feeling of the first emergency wore off.

Well, dull is what I got to be right now, she told herself. Adrenalin equals oxygen, and don't forget it. She forced herself to relax, muscle by muscle, until she was little more than a collapsed heap on the floor: two great eyes drinking in the drama being staged outside her window; two ears alert for the first summons from the complex personality of the machine around her.

For more than an hour, she stayed that way; then the chime *pinged* again for the routine 1600-hour check. Cathy performed her chores mechanically, paying close attention only to what part of the data related to the cloud. It was still holding shape and direction. Something better than three hours yet to wait before it was time for action.

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She sat down again, and remembered she had promised herself to call Mike again after this checkup.

But that was before the Alert. She couldn't do it now. Certainly not after snapping at Luellen just for keeping a contact open.

No, she wasn't even going to *think about* him any more; not till this business was done with, anyhow. Too easy to drift from memory and wistfulness into wanting to call; and such a swift slip from wanting to trying—

The bomb-set was absurdly simple. Usually, there was a certain amount of complicated geometry involved in the placement. But this one was straightforward. No tricky angle-shots this time—

THE open viewport was a black-felt billiard table and the dark ball of Earth rested in the golden pocket of the sun. Off to one side, an unknown player held an invisible cue-stick; nothing of it showed but the blue-chalked tip, where Venus ought to be—

And me behind the eight-ball. No, he is. One of us is.

Behind the eight-ball. Maybe he wasn't on Earth at all. If he was on the other side of the sun for some reason—

She tried to remember whether she had ever messaged cross-sol, and couldn't recall. But if it made any difference, she'd have learned about it long before this. Sun . . . thermal energy . . . she wanted a cigarette.

83.323.

She was hungry now, she guessed. It was food she really wanted, not a smoke.

Messaging would make her hungry. It always did.

One message equals two meals. But that was only in terms of direct oxygen consumption. It didn't figure thermal energy used up at the time, or the air and heat both that went into extra eating afterwards. The heat didn't matter so much righ now; the Station's thermal-erg reserve was a lot bigger than its oxy margin.

Sure, and it takes a lot more ergs to send than to receive a message, she reminded herself. Besides, she didn't *want* to call him. He could reach her if he wanted to, pride said, and common sense approved.

Just can't pull my poor self together. Stormy weather. . . .

IT HAD been raining on Earth, the first time she heard the crazy old song, on a tinny-sounding tape made from an antique disk-record. That was the one time they'd been separated before. Two weeks after they first met, when they had their first, last, only, quarrel. For a whole day she couldn't reach him. She didn't have any pride that time—and she had lots of air.

On Earth the air is free.

She kept trying to find him all day, and couldn't. Then she heard the song.

It had all the tearing, tearful nostalgia so typical of the early twentieth-century folksongs. It sounded close and loud, for all the cracked acoustics of it, but she couldn't figure out where the sound was coming from till she realized she'd found him at last. He was listening to it, playing it for her, too proud himself to say how he felt, but needing her back, and using this way to let her know, if she cared to hear.

A man can afford to be proud. Lucky for both of them that she knew *she* couldn't. He didn't try to find her at all; just sat listening to the tearful old tune, hoping she'd come and understand.

A woman couldn't afford to be proud. A Servicegirl couldn't take chances. Maybe that's why there were more women than men on the Stations, why women did better in psi-training than men. She'd heard something about new work with older people, where there was no sex differential in aptitude. A man, a young man, *had* to be proud. It made biologic sense. But it also meant somatic-semantic sets built-in . . . preconceptions that would naturally get in the way of free-associative interpretation of psi-somatic messages.

That meant it was up to her again, just like the last time. She was lucky

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to have found a guy who could psi at all. A guy worth having, that is.

But how could she do it? This time they hadn't quarreled. She didn't know where or how to look for him. No way of knowing even whether the scream in the dream had any meaning, or whether it was a product of her own subconscious fears.

Last month that wouldn't have occurred to her. But the psych tests didn't take into account the things that might happen when a girl met a guy.

Yes they did, too. That's why you were supposed to report it when anything like this happened. She hadn't reported. She'd wanted to finish her term of Service. They never actually fired you, of course. But somehow the girls who fell in love always decided to quit—after a few visits with the psychers.

Maybe they were right, if she'd got to the point now where she couldn't tell the difference between a dream of her own and a message from Mike!

She ought to try just once more. . . . *81.506.*

And outside, only the slimmest rim of light around the Earth.

You don't take chances on a Station!

It's not your own life you're playing with, Cathy. The Solar System has its eye on you.

No it doesn't either. Just a tiny corner of one eye, a veritable lewd wink of an eye. The sun can't see me now; it's got a cataract.

But the System depends on you, kid. How will all those lil chunks of rock know where to go if you don't show 'em the way?

"Traffic Control is the most vital agency in the Space Service. We are no stronger than the weakest link in. . . ."

Keep the vermin out of the skies. *Catherine Andauer, girl exterminator.* Somebody has to tell all the nasty little rogue rocks where to get off.

If things keep up this way, ole rockin' chair will get me. . . .

If things kept up this way, she'd have to report in for psych leave, that's all.

If she could, that is . . . if she could still send a message at all. . . .

Meanwhile, there was a job to do, and no one to do it but her.

81.487, and the chrono said 1735 hours. Seventy minutes to go. Too late to sleep now.

Exercise.

That was the next best thing. Or maybe the best. Use up more oxygen, of course, but she could afford a *little* bit. And right now it was more important to stay alert. Stimulation could do more than relaxation sometimes.

She strapped herself into the massager, and felt better almost immediately as rubber arms began to manipulate her stiff muscles, and blood started pounding faster through her veins. She gave it ten minutes—less than she wanted, but a compromise with the green index figure. Then, in lieu of the meal she still didn't really want, she opened a bar of vi-choc concentrate, and ate it slowly and determinedly, piece by piece, till it was all gone. Saved oxygen, too, she told herself, not heating a freeze-meal.

THE ceiling panel said 80.879 when the chrono read 1835, and the speaker said importantly:

"Final check before action. Commence last logging now. Initiate action in fifteen minutes. Last logging now. Final instrument check. Commence last. . . ."

She worked swiftly, surely, enjoying the feeling of urgency, as well as her own sense of competence. Meters and dials and familiar precision mechanisms—all things your eyes could perceive and your fingers could direct. Not like the strange uncharted stretches in the dark interior of self.

Check the loggings against the analog. Run the last equations through the calcker one more time. Everything should check. Everything would be exactly. . . .

But it wasn't.

The cloud was not behaving in an orderly fashion. It was diffusing, as she'd known it might . . . toward Earth.

A three-body problem, in a sense:

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the third body composed of millions of specks and bits and pieces; and behaving in gravitational terms exactly as if it *were* a composite mass—of fluid!

She had set up general equations to meet the possibility beforehand, but now she had to work quickly, filling in new data, and getting corrected results. She finished the comping and was still rechecking when the chrono speaker pinged again to remind her:

"Space suit. Space suit. Prepare for open locks. Space suit. Space suit."

Cathy slid out of her sandals, and kicked off to where the empty metal shell stood firm and tall inside its grapples against the wall. She floated into position "above" it, then pushed herself feet-first "down" inside. When her toes slid into place in the fleece-lined shoe-pieces, the torso section encased her up to her shoulders. She wriggled her arms into the flexible sleeves, and each finger carefully into place in the glove-ends. Then she pulled the headpiece out of its clamps overhead, settled it into place on the shoulders, and gave it a quarter-turn, pushing hard against the gasket pressure till she heard the closure latch into place.

She snapped on the headphone, tested the battery of switches and levers on the controls belt, turned off the magnetism of the shoe soles, and floated clumsily over to the compactly designed remote-control keyboard.

Six minutes to zero. Cathy threw the permissive switch that would allow the twin-bays in the bomb-storage compartment at the other end of the Station to open, as soon as the timing mechanism went into action. Nothing left to do now but close the "gills" of the space-suit, and open the valve on the built-in oxygen tank.

But it was too soon still for that. Two minutes ahead of time was S.O.P., just long enough to make sure the system was operating effectively. Actually, the whole space-suit procedure was an almost-unnecessary precaution. There were two solid bulkheads between Cathy and the bomb-stores, and between them twenty feet of liquid fuel. But Service practice on this point was firmly set: if any port in a space vessel is to be opened out of atmosphere, all personnel must first don space-gear. Over-cautious, perhaps, but sensible in its way.

More important, actually, in this case was the always-present possibility that the Station attendant might actually have to leave the Station during the operation. It didn't happen often—but it could.

Five minutes to go, and time now for a final clearance-check with Control-Central if she were going to make one. Once the gills were closed, she had no further choice in the matter; *any* kind of long-distance messaging, even blank reception, would drain the suit's small oxy tank beyond the safety point.

Under normal circumstances, the final-clearance was also S.O.P. But they wouldn't be expecting it now, with the complicating happenstance of the eclipse. And Cathy wasn't even thinking about Control Central at the moment.

Suppose he tried to call now?

Well, suppose he did! She'd been trying to get him for three solid days. If he tried once, and came up against a shut-out, he could damn well try again!

She *couldn't* call him now. If she *got* him, she wouldn't be able to stay in contact anyhow. There wasn't time.

It would be an hour, maybe more, after she closed the suit, before she could open up again.

She stood there, struggling with the impossible, and suddenly his image was so sharply in her mind, his voice remembered in her ears, the imagined brush of his lips against her face so vividly real that, knowing the figure for the delusion it was, she was immersed, in a salt-wave of loneliness and misery beside which all that had gone before was insignificant.

FOR a moment she let herself be inundated by grief. But for a moment only. One sob escaped her; then her gloved fingers fumbled for the gill-valve switch.

Better be lonely than dead, she told herself, and wondered what the differ-

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ence really was. But if he wouldn't answer anyhow, far better at least to be lonely alive than dead. Pride, this time, came to the aid of common sense; but with her finger on the switch, she still hesitated.

Three minutes still . . . In a swift compromise between desire and necessity, Cathy opened her mind to total blank reception; and even as she told herself once more on the thin top-conscious level that was still aware that she *couldn't* accept a call if it came—*she felt him,* and sent out a desperate searching hopeful answering cry:

Mike!

But there was nothing. Emptiness. Nobody there, until she felt the forming of a pattern that wasn't his at all. Luellen's? She couldn't wait to find out. The ringing in her ears was *not* emotion; it was the warning chime still sounding to announce the start of action!

Her finger on the switch exerted the small necessary pressure, and the suit was closed at last. Through the clear plastic of the headpiece her eyes sought and found twin dials on the control board where slim red needles moved in unison from left to right . . . *one tenth around already!* The timing mechanism was already operating, swinging open the two hatches on opposite sides of the cylinder from which the bomb and its counterweight in mass would be released.

How soon?

How long ago did it start?

A few seconds? Or a fraction of one? What should she be doing right now?

She could figure it out, of course, from the position of the moving needles, but there was no time for figuring now, and her mind, set for a routine pattern of familiar activity, refused to face the unexpected new demands.

She'd missed the opening note, and she couldn't pick up the beat. Like trying to remember the words to a song, starting in the middle of a line . . . *Jest can't pull my poor self together. . . .*

You damn well better, kid!

Then her mind focussed on what her eyes were watching; the control comp tape glowing on the board in front of her acquired meaning as well as form and color. Still, for one further stretch of time, uncounted and unrecoverable, her fingers twitched and trembled uncontrollably inside the heavy gloves. One bead of sweat, tracking across her cheek, seemed irritant beyond endurance.

She cursed herself and Mike and the Traffic Control Service in general and its many officers, sections and subsections in particular and in detail. Then she stopped cursing, or thinking about anything at all, and pressed down a button on the board, *knowing* it was right, without knowing which it was, or why.

The fingers of the gloves, activated by nerves and ganglia in the girl's hand, impressed her will effortlessly on keys and switches whose grooves and weights had been designed to suit their touch. Cathy herself, from that moment on, was a machine, a complex and delicate machine, within a jointed metal container. She was conscious of nothing, for the time, except the job at hand, and her capacity to perform it.

Girl, suit, and cylinder, bomb and dummy counterweight: they were one organism with one mind, one goal, one life in common; and between them they possessed every organ of perception or of motion that could conceivably be utilized to conquer the immediate objective.

THE bomb was underway now, curving through empty space outside, under the empetus of radio-directives from the board. No way, no way at all for the girl at the board to know whether the time lost had upset her careful calculations. She followed the luminous pointer as it worked its way down the calcker tape; set her co-ordinates and velocities according to the predetermined course; but never for an instant was she unaware of the danger that the delay—how long, *how long?*—might have made the whole performance useless.

Useless or worse. When it was done, placement achieved as planned, and there remained just one more act to perform,

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Cathy depressed the button that would fire the bomb, not knowing as she did whether her act was one of dutiful efficiency, futile stupidity—or suicide.

Then the pinpoint of light on the screen that piped the bomb vanished from sight. And the irregular area of interference fuzz now centered on the screen began to spread out and retreat, dissolving as it went. Like that. Done. *Right!*

HE STROKED her head absently, the fear not quite gone from his eyes above his broad grin.

"You dumb dame," he said tenderly. "Silly suspicious female. If you can't trust me when you can't see me, you better stick around after this."

Cathy smiled and stretched luxuriously, and woke from the wonderful dream to sweet reality.

"Hi, babe." *His* pattern this time. No mistake. "Awake now? Sure. Sure I'm here. I have been all along . . . almost all along. Except four hours maybe, till they got my leg fixed up."

"Your leg? What . . . ?" But she didn't have to ask. She knew. He'd told her in the dream, while she was sleeping. The accident. The torn second's pain, and her own scream, feeling what he did as she slept, and then he was gone, and she was terrified.

He'd shut her out briefly, to keep the pain from her. And when he tried to call her back again, he couldn't find her.

His pride, she thought with a smile now. *It* was *his pride.*

He wouldn't share the pain. And she *couldn't* share her fear. From the first moment that she thought he'd left her, from the beginning of her harried searching for him, from when she'd let herself mix motives and meanings with the memory of her own scream—from that time on, it was increasingly impossible for him to make contact with her. From that time, till she fell asleep in the total exhaustion aftermath of the day's work. "Okay, babe?" he asked. "You all right now?"

"I'm fine," she answered. "I'm just fine now. But Mike—don't go away again."

"Never," he promised, and she thought: *I can walk in the sun again.*

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TOPOLOGICALLY SPEAKING—

By GEORGE O. SMITH

SPACE, we are told solemnly, is curved.

If we take off on a straight line and keep on going, we will return to our starting point from the other direction because we have circumastrogated space, just as we circumnavigate the Earth by heading along one line of flight and keeping on going. This space curvature is, of course, in the fourth dimension so that our physical senses cannot fathom the curvature except by secondary evidence.

This latter is explained in several popular books, one of the better of which is Dr. George Gamow's *1, 2, 3, Infinity* and in essence it goes like this:

If space were linear, then doubling the unit radius of observation would show a linear increase of the number of distant galaxies therein contained. However, if space is curved in the four dimensional parallel to a sphere—in other words, self-enclosing—then doubling the unit area of observation would show that there are fewer galaxies in the outlying regions than a linear increase would show.

This may not be entirely clear—so let's show it graphically. In Fig. 1, the total area enclosed by Radius R2 is four times the total area enclosed by Radius R1. This is because the area of a circle is proportional to the square of its radius. Since galaxies are more or less all separated by about the same distance, they can be represented by a regular pattern of spots, and if one counts these

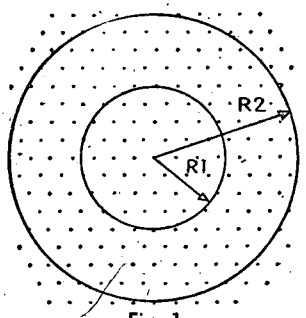

Fig. 1

spots it will be evident that the number of spots (or galaxies!) will be four times greater in the area enclosed by R2 than in the area enclosed by R1.

In space, of course, we are concerned with volumes instead of areas, so the linear increase in the number of galaxies would increase proportionally to the cube of their radii. Double the distance through which space can be observed and a linear increasing space would show 2x2x2 or eight times the number of galaxies.

But if space were curved positively (which means that the curve bends always in the same direction such as on the surface of a sphere, Fig. 2), it can

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be shown that the surface area enclosed by Radius 2 is not quite four times the area enclosed by Radius 1. The resulting

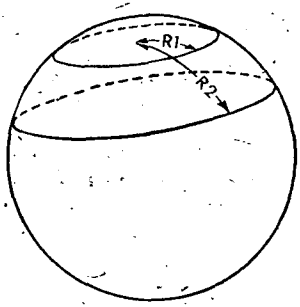

Fig. 2

number of spots, (or galaxies) enclosed by the two radii are therefore less than in linear.

The opposite proposition is if space is curved negatively, which means that the curvature does not all lie in the same direction, which is the case in a saddle-shaped surface (Fig. 3).

Here the area enclosed by Radius 2 is greater than the area enclosed by Radius 1, and the spots, or galaxies, will be more numerous.

That we cannot take a quick look and come up with an answer is due only to the fact that the curvature of space is so minute that all sorts of experimental errors are introduced. There are poor observation conditions, the galaxies are not all neatly spaced apart like a linoleum pattern, and the curvature of space is so gradual that these several experimental errors may show an increase in one part of space while other spots show decreases. Increasing the total distance across which such observations can be made will tend to clarify this situation, which is why we keep building bigger and better telescopes.

But George Gamow seriously considered the argument that space might be shaped like some four-dimensional Möbius figure, and that he who circumastrogated space might find that he had been rotated on his trip so that his heart would be on the right hand side and his appendix (or the scar therefrom) on his left. He also suggested that some shoe manufacturer might build only right shoes and ship half of them around the universe for making lefts.

Here Dr. Gamow stopped. He had other things to cover in his book, so he had no time or space to go tinkering with what is obviously a screwball idea. Since the Big Brains are still haggling over the curvature of space, and also undecided whether or not such a curvature will ever be proved or disproved to a final conclusion, hurling in the idea of a Möbius curved space would only confuse the issue.

But I would like to consider the problem honestly and objectively for the moment. Please remember that I am part fiction writer and part radio engineer, and neither of these skills qualifies me as cosmologist, astrophysicist, philosopher, or guide. I just like to toy around with cockeyed ideas.

So . . . .

LATE in the Eighteenth Century, Napoleon Bonaparte made a rather important contribution to science and invention. Napoleon was no scientist, but he was a man with foresight and imagination. When he came to power, he recognized the need for a number of things, and he came to the conclusion that one way of getting them was to offer prizes of money to the inventor who solved this or that problem. Napoleon, therefore, seems to have been the first ruler to recognize the importance of concentrated scientific research.

Now, one of the things vitally necessary was a method of depicting some article on paper so that it could be fabricated by someone else. Apparently up to that time the designing engineer had to be half machinist, and every machinist had to know the elements of design. In other words, you either made it yourself, or you got an artisan whose grasp of intricate machinery was good enough to make the gizmo fit the frammis-pivot. This particular prize was won by a man named Monge, whose method of three-plane projection is still used in the drafting rooms today.

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Then in the early years of the nineteenth century, August Ferdinand Möbius, Professor of Astronomy and Mathematics at the University of Leipzig, went to work on Monge's projection method of drafting and produced the foundation of the science called "projective geometry" which is now called descriptive geometry. With descriptive geometry, the student can draw front-side and top-views of a prism placed at some odd angle and being pierced by a three-sided spire. The development of the surfaces can be laid out. The paper may be cut along the solid lines, folded along the dotted lines, pasted together by the paste flaps, and then he can insert his spire through his prism and everything will fit.

(In school, we cut them right out of the drawing paper because if it fit we didn't need the plate any more and if it didn't we had to start over again anyway!)

Professor Möbius is the gent for whom the Möbius strip is named.

I think everybody knows what a Möbius strip is. If not, get scissors and paper and a bit of Scotch tape and make one. You cut a strip of paper, make a circle of it, and then before you paste the ends together, you give one end a half-turn so that when it is joined, one side of the paper on one end meets the reverse side of the paper on the other end.

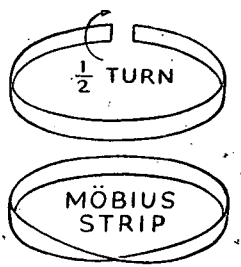

Fig. 3

Now, by tracing along one edge around this half-twisted loop, you'll go twice around the loop and return to your starting place without having crossed the surface of the paper. If you ignore the joint in the strip, you can accept the statement that a Möbius strip is a figure that has only one edge. Running a pencil along the surface, you'll again go twice around the loop and come back home, proving that the Möbius strip has only one surface.

Now, if you take a sheet of paper, it has two edges, two ends, and two surfaces. Make a plain loop out of it and you have eliminated the ends. But it still has two edges and two surfaces, separate from each other. To cross from one edge to the other, you must cross a surface. And to go from one surface to the other, you must round an edge. If you cut this loop in half, your scissors will have created two new edges and divided the area of the surfaces in half, providing a total of four surfaces. In fee simple, you have, by cutting, multiplied the edges and surfaces by two. If your sheet of paper is not made into a loop, you've also multiplied the number of ends by two.

Similarly, if you cut a Möbius strip in "half" you provide a multiplication by two. Your strip is now possessed of two edges and two surfaces and therefore it is no longer a Möbius strip. (It does have a full twist along the loop, however!) Further dividing of the strips will only get you into a mess of tangled loops, but the original experiment is finished.

So we can take a look at the comparison this way:

	Edges	Surfaces
Loop	2	2
Möbius	1	1

IT DID not take very long for Charles Klein to wonder about expanding Professor Möbius' little stunt into a true three-dimensional surface. Topologically speaking, the Klein flask is only a Möbius strip extended to close around itself, just as a sphere is the result of rotating a circle about a line drawn across its diameter.

The Klein flask has no edges and only one surface. It is unfortunate that we cannot pass through the fourth dimen-

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sion, or that two things cannot occupy the same place at the same time. The Klein flask, to be constructed or drawn, must be provided with a hole so that the thin section can pass inside of the horn. Theoretically, this hole does not exist. Ignore it as a necessary evil.

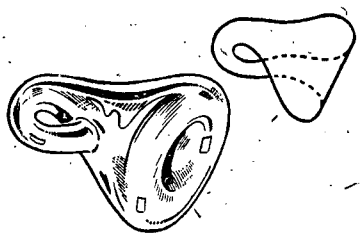

Fig. 4

I have only seen one Klein flask. It was built by a man taking Advanced Tinworking in a trade school. He built it for a class project. But this character was antisocial and also completely blind to the benefits of the empirical school of science. He steadfastly refused to let anybody attack his treasure with a pair of snips to see what would happen. I have, therefore, expunged his name from my memory.

However, tackling this problem from descriptive geometry, you find a number of interesting things take place when a Klein flask is attacked with scissors.

1. Cutting the flask apart along the dotted line in Figure 9 produces two Möbius strips.

2. Cutting a thin segment along the line in Figure 1, say a fraction of an inch on either side from the median line, produces two Möbius strips and one untwisted plain loop.

Remember that cutting creates two edges and doubles the number of surfaces. Since the Klein flask has no edges, and only one surface, the single cut creates two Möbius strips, each with one surface and one edge! The taking of a segment requires two cuts, one of which makes two Möbius strips and the second of which merely cuts a slice off of one strip.

You can cut other chunks off if you wish, but it is legal for Möbius strip or Klein flask cutting only if you take your cut over the lip of the horn and down around the looped neck below.

We can now compare the Möbius strip with the Klein Flask as follows:

	Edges	Surfaces
Loop	2	2
Möbius	1	1
Sphere	0	2
Klein	0	1

(Please accept the fact that a sphere is a hollow figure and not a solid. We'll call the solid ball a "globe" for differentiation.)

IT IS obvious that cutting a sphere in half produces two hemispheres, each with one edge and two surfaces, proving that cutting provides a total of two new edges with each cut and doubles the number of surfaces.

From the comparison above, two things are obvious. First, that the more complicated geometric figure has the least edges, and, since it started with so few, the edges drop out of the picture after the first comparison.

Second, that in both cases the Möbius and Klein figures have one-half the number of surfaces of their more regular counterparts.

A loop and a Möbius strip may be compared; the Möbius is only a loop with a half twist. A Klein flask is only a sphere which has a half twist in its surface, so that at the "joining" point, one side of the material meets the other side and forms a single geometrical surface. In fact, if one could use the fourth dimension practically, the Klein flask would probably look like a sphere halfway through the process of being turned inside out.

But let's take one more step into the dark. Consider the configuration of a solid with a Möbius-Klein twist. This might be compared to the solid globe, fourth-dimensionally turned back upon itself. But the solid globe has no edges and only one surface:

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	Edges	Surfaces
Loop	2	2
Möbius	1	1
Sphere	0	2
Klein	0	1
Globe	0	1
Space	0	?

Now remember that the Möbius-Klein twisted figure always has one less surface than its untwisted counterpart. It is an unfortunate circumstance that the ambiguous figure 2 comes into the picture, because it might be argued that the twisted form has one-half of the number of surfaces of the untwisted form. However, the meaning of the word "surface" does not carry any suggestion of quantity. "One-half" of a surface is like stating that a quart of absolutely nothing holds twice as much nothing as a pint. So Möbius-Klein space would be a region that had neither edge nor surface.

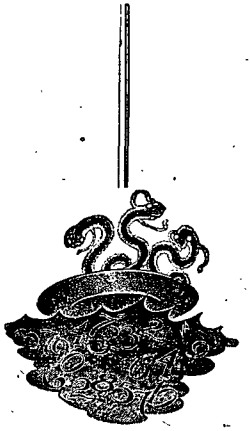
Now, if space had neither an edge nor a surface, then *space has no boundary!*

This satisfies a number of questions. First, the space traveler can take off in any direction and return home, having circumastrogated space. His only turnover would be a rotation in space somewhat analogous to the human's turnover in space as he makes his way around the Earth. He might come back left-handed, or it might get downright messy because he has turned inside out! Second, it provides for a true infinity of space, for any region that has no boundary is, by definition, infinite in extent. Third, it settles forever that silly question of what lies beyond an end of a linear space or without the confines of an enclosed space.*

Any comment, Dr. Gamow?

*The "Expanding Universe" adherents state that at the present time, the extension of the universe and its rate of expansion is such that a beam of light starting now would never be able to circumscribe the universe, because the linear expansion has arrived at a value so great that the solid circumference is expanding in dimension greater than the velocity of light.

THE SAUCERS RETURN...



The discs descended gently thru
The carbon-crowded air—
And all the world was dark in hue,
And silent everywhere.

They saw the ravaged valleys
And the badly pitted plains,
The broken streets and alleys,
The radiant remains.

And there was stillness in the sea,
And not a bird that flew;
And where the people used to be,
Only a wild wind blew. . . .

—A. Kulik

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"No," said Arnheim to the man outside, "I cannot let you in."

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EVERY eighth minute the emergency transmitter peeped its distressful peep into the indifferent emptiness of the continuum. It was mindless and immortal, and the passing years could never diminish the hopefulness of its bell tones until such a time in the unguessable future as Earth might collect a stray signal on her scanning screens and release a robot ship to the rescue.

Meanwhile the starship, *Pegasus Three*, lay belly down in the dust of a bleak, nameless planet and waited, hovering over her two mites of human passengers like an anxious mother hen.

It was she, and not they, who was master of the situation. She who had chosen this nearest suitable harbor with her searching radar and landed with her auxiliaries, after the mains had exploded under meteoric bom-

The Garden

By CHARLES A. STEARNS

They were spacewrecked and couldn't stand the sight of each other. . . .

bardment. She who had, without directive, begun the signal to Earth. *These are yours. You must come and take them home. I will protect them until you arrive. . . .*

And protect them the *Pegasus Three* did. Out of the thin, dry air she gave them water and carefully measured oxygen. From her capacious dispensers she brought forth daily food concentrates to keep them alive and superbly healthy. She yielded up a micro-library, a vest-pocket movie, a variety of games and hobby kits. Within her capabilities she gave them everything with which a man alone might need to amuse himself.

The seeds were concealed in a rather large and ornate plastic container marked, FOR THE AMATEUR GARDENER. There was nothing sinister about the container; no hint of the potential of trouble it held. No one had opened it—yet.

Illustrated by PHIL BARD

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CAPTAIN ARNHEIM, nominally master of the *Pegasus Three,* stood before the great lateral viewport and cursed the uncharted desert world before him, scorning to be grateful for his deliverance.

His eyes were upon the squat, dark figure approaching from across the red wastelands. It was Elsworth, returning like a bad penny. *God! To be penned up with a man like Elsworth for half a lifetime!* He had sent the man out three hours ago, hoping against hope that he might get lost.

Elsworth was the supercargo. "Space-going clerks," Arnheim called them. They were all of a pattern. Stupid, unimaginative, near-sighted. Lost without their pencils. What business had such as they among the stars?

With every fiber of his gaunt, tense frame he loathed Elsworth. With a deep, hopeless passion that had burgeoned the first day out and grown each hour of their voyage together, he despised him.

That was nothing. He had hated often; he was a man who knew how to hate. But within the span of the interrupted journey they had been able to keep apart, each man to his own place in the ship, Arnheim forward, Elsworth aft near the cargo spaces, with his robotic equipment that handled the lading and unlading. Now they were to be confined in the communal emergency quarters, a single compartment, and could no longer avoid being together.

Shapeless blob out there in the desert! If only—a very ugly thought had come into his mind. Arnheim refused to recognize it, shoved it back into the subconscious . . .

It was not right that he should have to be subjected to Elsworth, a man too gross, too ponderous, ever to dominate. Captain Arnheim believed heartily in domination. It was unthinkable that they should be able to live together in amiable equity. Suppose Elsworth chose to play his records when he wanted to read? Elsworth was addicted to Wagnerian opera! Suppose they both decided to use the single shower facilities at once—or the sunlamp—or the exerciser? And suppose neither man would give in? They could disagree on trifles; they undoubtedly would. He was the captain, but how long could he maintain authority? Elsworth was big; Elsworth was strong. He had shown himself an independent in the past. He would be more stubborn, more intractable, more unbearable now. And worse, he would always be unaware of his offensiveness.

Arnheim shuddered. He was a slight man, but his emotions were huge.

The intercom crackled suddenly with the burdon of Elsworth's labored breathing. He had switched on his transmitter. He waved at Arnheim, unnecessarily. His booming voice filled the compartment. *"It's me, Captain? Do you read me?"*

Arnheim flicked a switch. "Of course," he said into the mike, watching Elsworth narrowly. "Go ahead."

"Well, I didn't find anything. Not a thing. Just rocks and this red dust, six inches deep all over everything. And nothing living. The air is thin, but I think it's breathable, and the temperature is plus twenty-nine centigrade—not bad—and probably gets a little colder at night."

"Habitable, then," said Arnheim, half to himself.

Elsworth looked up, shading his eyes with one hand, endeavoring to see him in the window. The sun was in his eyes and he squinted in vain. *"What's that?"* he said. And waited for an answer.

There was none forthcoming. He shifted a trifle uncomfortably, without taking his gaze from the port. *"Say, Captain Arnheim,"* he said, *"You're going to let me in, aren't you?"* His voice was half humorous, half whimpering.

The release lever for the outer door of the airlock was within reach. He took it in his hand, fondling it for a moment. And all at once he knew that he had planned it this way. He had sent Elsworth out for this, and nothing else. That was the thought that he had refused to recognize until now, the enormi-

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ty that he had shuttled from his conscious mind until this moment.

"No," said Arnheim, and was amazed at the calmness of his own voice. "No, I cannot let you in."

There was a sun-grin on Elsworth's face. He stood in that position, hand shading his helmet, face contorted, not moving, not speaking for more than a minute. He was like a huge, misshapen statue, standing in the reddish light of twin suns.

The slob!

"Captain?" Questioningly now. Frightened. Pleading.

Can't ignore him. Better to reach an understanding now, and have it done with. Think swiftly.

"Listen carefully," said Arnheim. "Are you listening?"

"Yes."

"Good. I am prepared to be lenient with you. Each morning I shall place food and water in the airlock. The outer door will be open for ten minutes, but the inner one will be closed. You can come into the lock, get the provisions and then leave. You'll have to make out for shelter the best you can. The exposure suit should be protection enough. Clear?"

"But why—why?"

"Because I cannot stand to have your stupid carcass near me," said Arnheim, with feeling.

THE *Pegasus Three,* patient, wheedling, gave its electronic message to space. *Earth, come and claim them. I will nourish them inwardly; I will protect them outwardly from the inhospitable universe. But I can not protect them from themselves. Hurry!*

He wanted badly to do Elsworth violence. He had never wanted anything so much in his life. All day Elsworth had sat upon a round, red boulder, in plain sight, gazing with fixed reproachfulness at the viewpoint, where he sat playing chess. He had switched off the intercom; Elsworth could no longer communicate with him, but the message in his eyes, that was still plain to be read.

He envisioned Elsworth going over and pounding on the outer door of the airlock with his huge, hairy fists, heard the faint thud of the fists from inside. Envisioned him crying silently and ponderously within his plastic helmet, like a goldfish gaping inanely in its bowl.

But Elsworth did none of these things—how much easier if he had! He merely sat and looked. Darkness finally blotted out the unpleasantness of him sitting there, and Arnheim gratefully ate his meagre supper and went to bed. It would not be necessary to feed Elsworth tonight. That could wait until daylight. Safer.

It was some three hours later; he'd almost drifted off to sleep when the scuffling sound came. It was soft at first, then louder, more insistent. A dull thud, heavy hands clutching, scratching . . . He turned on the light.

Like a full moon the pasty face of Elsworth appeared over the edge of the lateral viewport. The hands were raised in meaningful gestures; in supplication. Soundless entreaties shaped by the lips.

"Get out!" screamed Arnheim, and threw a shoe. Elsworth drew back instinctively and lost his balance on whatever he was standing. The window was ten feet above the ground. He waved his arms wildly and then disappeared, backwards. There was a rumble of falling stones; then silence.

Arnheim sprang to the viewpoint and peered out into the dim starlight. Below, the dark blob of Elsworth's body moved on the ground among the stones. He was not dead. He got up and slunk off in the darkness, limping slightly.

Arnheim went back to bed and sought sleep with belated success. Several times his dreams awakened him. They were disturbing dreams, foreign to his nature. Frightful dreams of vengeance. . . .

IN THE morning Elsworth was sitting, a great, inert lump, upon the red rock. His helmet was smashed. He wore only the jagged fringe of it about his neck like a too-large crown. He sat, wheezing, laboring to get enough of that

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rarified air in his lungs, but otherwise showing no ill effects, even as he had predicted.

Arnheim fed him, cautiously, as one feeds a ravening tiger, making certain that he was not near the airlock when he set the food and water in it. He left the outer door open exactly ten minutes, as he had promised.

Afterwards he found the chess board, went forward to the table in front of the viewpoint, and played eight games, was trounced eight times by his ingenious electronic opponent, and finally flung the board across the compartment in a sudden, inexplicable fit of anger. In a part of his brain a small warning signal flashed, but he did not heed it. Not then.

He glanced out at Elsworth, back on his usual perch. It had seemed to him, from the corner of his eye that Elsworth was laughing. He was not; it had been a trick of this strange, dual, reddish light. There was the same expression on Elsworth's face as before. The dumb reproach; the bewilderment. No anger; no vengefulness.

Arnheim felt almost a twinge of satisfaction. The protective chemistry of his brain was subtly in action, working to save his sanity, perhaps. Goddam him! he thought. Why let him bother me? I hate him; why not enjoy his predicament? That's it. Ridicule him. Take open pleasure in the sight of him there day by day. Revel in his misfortune, and be thankful the situation is not reversed. If this is latent sadism, let it come forward and stimulate me!

Suddenly he found himself pounding on the heavy glass of the viewport, and waving at Elsworth, laughing at the stupid astonishment on his face.

The next instant he felt embarrassed, frightened at his new lack of self-consciousness, but a part of his brain whispered that before long he would be able to play the game at length, and savor it without qualms.

THERE are people who cannot bear to be alone for a long while. It occurred to Arnheim, after a time, that he was being a fool. He had imagined that Elsworth sat out there on that rock just to reproach him, to irritate him and make him uncomfortable. Now he was sure that this was not the case. Elsworth was sitting there in order to be *near* him; humbly grateful for a glimpse of his fellow man—even of the man who had exiled him. Elsworth was lonely.

So that was it! Well, he would fix that. He had grown to enjoy the daily prospect of seeing Elsworth on the red rock, scratching the irritation of the accumulated filth within the heavy suit which he, for some reason, had never removed, of Elsworth bathless and miserable, idly pretending to scan the gently curving horizon, while stealing glances at the ship. But even though it cost him pleasure he would take care of that viewport.

He found a blanket and hung it over the port, and later on, when it occurred to him that he could have his cake and eat it too, he cut a small hole in the blanket for spying, and was elated by his own cunning. He could watch Elsworth now, but Elsworth could no longer take comfort in his presence.

It was a brilliant plan, and it had its effect. His subject no longer spent his days in stupor. He began the practice of pacing back and forth alongside the ship, from stem to stern, sometimes gazing up at the blanked out port, but mostly with his eyes on his feet. The spare diet, the hardship and exercise, were inexorably streamlining Elsworth. He was thinner, more active, and his beard, grown long and heavy, had become a tangled wilderness, out of which his prominent eyes stared, like the eyes of a wild thing from the brush.

Pacing like a caged animal! That was one of the first signs, Arnheim was positive. He spent a great deal of time watching through the hole in the blanket. He had never watched a man go mad before.

He had continued to feed Elsworth with some regularity, except when it escaped his mind. (He was becoming more and more absentminded of late.)

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It would have spoiled everything to deny him for too long.

Each morning when he collected his rations, Elsworth would leave the empty tins from the day before in the airlock to be refilled. It was in the sixth week that Arnheim found the note in one of them. It read:

FOR GOD'S SAKE, GIVE ME SOMETHING TO DO; TOOLS, A KNIFE, A DECK OF CARDS, ANYTHING. PLEASE, IF YOU HAVE A GLIMMER OF SANITY LEFT!

He read the note and smiled. Elsworth was cracking up, and he knew it. He must hope to stave it off as long as possible, but he could see it coming now. The loneliness, the inactivity would take him soon.

He went over and looked out through his spy-hole. Elsworth was waiting before the lock for his answer. Well, let him wait.

The note had given him an idea, however. He needed new diversion himself. He had tired of the tri-dimensional movies, that were at first like a few moments back on Earth. He loathed the sight of the gaming boards; they only confused him nowadays, and made his head hurt. He rummaged through the emergency gear, idly, and quite by chance he stumbled onto the box of seeds.

The irony inherent in this neat package with its miniature spade and trowel, its bright seed envelopes, its instruction book and cellophane-wrapped bulbs, so out of place on this arid world, might at another time have appealed to his sense of humor.

Now it only precipitated a mindless red rage—this bland assumption of the people of Earth that her life could survive anywhere. He threw the box down, hard, and kicked it, succeeding only in hurting his foot. He found himself shuddering with the intensity of his emotion; panting from some inner exertion.

He had, presently, a singularly clever idea. He took up the box, wrote a note and placed it inside it, and set it in the airlock where Elsworth could get it next morning. The note read:

HERE YOU ARE; PLANT YOURSELF A GARDEN!

He shut the inner door and locked it, and for a space of ten minutes he lay upon the deck in a fit of helpless laughter. The prank had so appealed to something in him that he felt renewed in spirit for the rest of the day, and he did not even mind so much going to bed that night, despite the fact that he had come to dread certain recurrent dreams that came to sit upon him in the darkness, like foul incubi.

ELSWORTH did not rage; Elsworth did not cry. He took the box and went over and sat down in the red dust with the box between his legs. He opened it and examined the colorful packages within at length. Then he looked up at the viewport with a long and penetrating gaze. Arnheim recoiled from the gaze as though it could pentrate the blanket. He could not help himself.

The fool, the utter fool—was he going to—

Elsworth was. He spent the rest of the day lugging stones. Big stones, little stones, any stones that he could find within a quarter-mile radius of the ship. He brought them there and built a kind of bed with them, three feet high and eight feet long, that reminded Arnheim of a hollow cairn.

Then he began to scoop in the red earth with his bare hands. It was a long, arduous procedure, but he did not seem to mind. Yes, there was no doubt about it, the idiot was going to plant the seeds.

Each day for two weeks Elsworth poured half his daily ration of water into the thirsty soil. By day he lay upon the cairn, and by night he slept there, shielding, presumably, the pitiful bit of hoarded moisture from the ravenously dry atmosphere.

It was oafishly clever, and Arnheim had to laugh. He began to take a pure, pagan pleasure in the project, and to feel an interest in Elsworth that he had not known before. He spent all of his

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waking time peering out from behind the blanket. On the fourteenth day he knew that the time for the planting had come, and was almost uncontrollably excited.

Elsworth had unwrapped his trowel and shovel that morning and laid them out carefully. He had taken out the seeds and chosen several packages which he put aside. He had run his fingers into the damp, red soil, and shown a certain satisfaction by his posture as he let it flow from his hand.

Now he would plant the seeds and wait patiently for them to germinate. Down in the red mud the seeds would swell and send out small feelers, testing whether this new world be sympathetic or hostile. They would test; they would burst with the intensity of their efforts, and they would die.

After a month Elsworth would dig them up, one by one, and when the last rotted seed and bulb was disinterred, he would throw his first tantrum. He would tear down the cairn and scatter the red soil to the winds. He might shriek some soundless evil at the shrouded viewport where Arnheim lurked; perhaps even throw stones, impotently, at the window.

Somehow this vision had a momentary reality for Arnheim. He found himself pounding on the viewport with his fist, dancing, damning Elsworth with screaming enthusiasm. When he caught himself he withdrew, frightened, to a corner and huddled, shivering, over an autochess board for the rest of the day. His dreams that night were singularly dreadful.

THE first light of morning found him not rested, but hopelessly wakeful. He got up and padded to the viewport, peering out with a caution which seemed absurd, and which he could not help.

Elsworth, dim in the dawn redness, was sitting upon the cairn. He appeared to be deep in thought. He had not planted the seeds yet, for the packages still lay upon the ground. Arnheim cunningly watched him throughout the morning.

Toward noon Elsworth got up, stretched, and favored the starship with a bold look. He seemed decisive and restored. He walked up and down for half an hour, flexing his arms, and then resumed his seat on the cairn.

But there was a difference in his attitude now, a change in his eyes. A strange brightness. *Could it be that he had caught on? Could it be that he had remembered the first law of life itself?*

The savor, the pleasure in the hoax, eluded Arnheim that day. Try as he would, he could not recapture it. He felt disquieted, restless; felt the recurrent twinge of some painful sub-thought that eluded reason. If only something would *happen*.

But it didn't. At dusk Elsworth was still sitting there, watching, waiting for something. Heaven only knew what.

Arnheim turned out the light and got into bed, snug against the skin of the ship, thankful, for once, for its protection. He felt the need of shelter tonight.

Sleep, as usual, came with difficulty. Once he roused himself to look at his wrist-chrono. It was twenty-three hundred, sidereal time, but past midnight here. A melange of thoughts, and vague apprehensions were bursting his skull, merging from consciousness into a fantasy of half sleep, half wakefulness; a laboring of his brain that would allow no rest. Over it all was the image of Elsworth's strangely bright eyes.

He knew, at last, that it was the eyes that had aroused him, troubled him. They had been too bright. Abnormal. He was here; Elsworth was out there, shivering, impotent, sitting upon the self-constructed bier.

He slept for a time, and in his dreams he was stalked by something gross and shaggy. Something altogether horrid. He ran and ran, but he could not elude his pursuer. Not for long. It lurked behind every red rock, within each shadow.

He awoke, breathing hard, and felt the reassuring smoothness of the steel bulkhead in the darkness, sensed the faint, powerful pulse of the starship's deathless power plant deep within its heart; knew the comfort of the impene-

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trable shell of the *Pegasus Three* about him.

And yet he would not—could not—breathe. He had awakened in an attitude of painful listening, and the spell of it clung to him.

He held his breath for a long time, and presently it came to him.

There was something in this compartment. . . .

ARNHEIM switched on the light, dreading what it might reveal. The compartment was as before. No one here. And yet the feeling would not leave.

He tried to retrace his dream. The thing in the darkness had been fear—but what had spawned it? What subtle recollection. . . .

And suddenly he was out of his hammock with one bound, shivering in the coolness.

He knew what it was that had awakened him now. He had forgotten to close the outer door of the lock after the morning feeding!

He went over to the switch and threw it; then he sat down and got his breath, wondering why he was breathless.

There had been no danger. The inner door had been bolted from the inside. No one could have entered.

Yet, suppose that Elsworth were *in* the lock this minute; suppose that he would be there when he opened the door in the morning to set out his rations.

Would he smother in there? Would he have enough air to last until morning?

Not dead, said the voice inside Arnheim. *He mustn't be dead. You'll be all alone.* You need Elsworth, even while you fear and hate him. Need him because you are the only human beings in this measureless waste of space. That is why you kept him alive all these months. That is the reason you cut the hole in the blanket over the port. You needed the hourly reassurance that he still lived. . . .

He chose a fire-ax, finally, as the best defensive weapon. He had to open the door—to see—but he would be ready. He was faster than Elsworth. There could be no real danger. Yet his hand lingered on the switch.

He crouched in readiness as the oval door began to open, to swing silently inward, in the darkness of the lock. He waited ten seconds . . . fifteen. Nothing happened.

He peered cautiously into the half-shadow of the lock.

No one there. The outer door had closed. The bottom of the inner door swung ajar, its bottom a foot above the deck.

He turned and flung the fire-ax in a corner with a sigh of relief.

Almost as an echo the sound came. A dull chuffing. He wheeled. The dark shape had fallen, like a giant slug, from the back side of the door where it had clung so cunningly.

"Ellsworth!"

Too far to spring for the fire-ax. Nothing within reach. Nothing to do except retreat.

He backed slowly away.

"What do you want?" he whispered.

Elsworth said nothing.

"The—the seeds," said Arnheim, talking desperately. "They won't grow. I knew it all of the time. It was a joke, you understand. I'm sorry, but there's nothing we can do about it."

ELSWORTH nodded slowly, shaggily. *Was that a glint of humor in his eyes? Oh, God, can a madman have a sense of humor!*

"No," said Arnheim. "Nothing can grow in this barren soil. There's no humus. No organic matter. You've got to have decomposed organic matter in the soil. That's what life feeds on—don't you see? Life feeds on—"

Elsworth was still nodding. *It was humor. Some monstrous secret joke.* Elsworth *knew* what it was that life feeds on.

"Stay away from m ," said Arnheim, huskily.

But Elsworth kept coming. They both knew about life.

And soon it became a fine, healthy garden. ● ● ●

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Second in a Series

Aristotelian and NON-Aristotelian LOGIC

By GOTTHARD GUNTHER

THERE has been much talk of adding to the traditional and classical logic of Aristotle a new technique of thinking which is intended to cover a range of problems the older technique is incapable of dealing with. Since the discovery of German mathematician Karl Friedrich Ganss (1777-1855) that Euclidean geometry rests on arbitary axioms and that if you replace these axioms by a different set of assumptions you may get a different geometry, logicians have asked themselves whether the same might not apply to a system of logic as well. We know now, about one hundred years after Ganss, that this is indeed the case and that by introducing new logical axioms we can indeed develop non-Aristotelian systems of logical calculation. Such calculi are already applied to quantum mechanics, they play a tentative part in social sciences, but their most important field will probably be in cybernetics.

It is pretty well established that the human mind can think only in Aristotelian categories. Mechanical brains, however, will work differently and will eventually be able to "think" in non-Aristotelian forms of reasoning.

There is one specific kind of mechanical brain which will not work at all unless it is equipped with the machinery of non-Aristotelian thinking. That is the thought translator. Well and good! But what is a non-Aristotelian thought process? Obviously, to answer this question we must first examine the classic logic of Aristotle. The discovery of formal logic is a very recent affair in the history of mankind. It hardly dates more than twenty-five hundred years back.

The first discovery of formal logic in Ancient Greece—the so-called Sophists—were rather like traveling magicians or first-rate circus performers of our days. You paid your admission and watched the "artist" perform his tricks. He would, for instance, single out a man from the audience and address him as

What kind of thought process should be expected of the seetee alien mind?

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follows, "You admit, sir, that you have that which you have not lost?"

The innocent answer was, "Of course."

"Then, my friend," the Sophist blandly continued, "as you never lost a tail, you must have a tail."

The performer might select a woman known to be a shrew and ask her, "Madam, have you stopped beating your husband? Answer 'yes' or 'no!'" This proved an embarrassing alternative.

Among those laughing at the befuddled woman was a man with a dog. The Sophist turned to him and inquired, "Is this your dog?"

"Yes."

"I see it is a female dog. Has she had puppies?"

The proud owner of the dog affirmed it.

Diabolically the Sophist concluded, "This dog has two properties. First, it is *your* dog, and second it is *mother*. Let's add up the predicates: this dog is your mother."

The performer's mental gymnastics were successful because it was little known in pre-Aristotelian times that formal logic is based on a strict technique, and that the skillful "logician" can do amazing tricks when using (or misusing) that technique. Audiences today are more sophisticated and not so easily fooled.

NOW, if logic is a rational technique it can be technically handled. This is done by the method of propositional calculus. Propositional calculus is the technique of combining logical statements according to their truth values. In order to symbolize any two statements we use the letters p and q.* We also use the tilde (~) which is supposed to represent the negation, and a dot (.) which shall have the meaning *and*. We therefore read ~p as *non* p, and p.q. as p *and* q. The letters p and q may represent any two statements we choose. However, to work with our symbols, ~ and . , we have first to fix their meaning and show how they work. This is done for the negation ~ by the following table:

p	~p
(true) 1	2 (false)
(false) 2	1 (true)

This table indicates that if p is true, then ~p is false, and if p is false, then ~p must be true. Instead of the letter T for true and F for false, we have inserted the first two natural numbers for greater convenience. We will later develop tables for a non-Aristotelian logic, and this can be done more easily by dealing with numbers than with letters.

It is this table which has given Aristotelian logic the name of a two-valued logic. Any statement in this technique of thinking must have one of the two values: it is either true (1) or false (2). No third value exists. True (1) and false (2) are mutually exclusive. The other term . (and) is similarly defined. And is supposed to convey a connection between two statements. When we say, "the sun shines *and* the wind blows," the two independent statements about the sun and wind are merged into a compound-statement by connecting them through the word *and*. The problem now is to find out under which logical condition the compound statement shall be true. It stands to reason that the truth of the two independent statements is a question of meteorology rather than of logic. We shall, therefore, give them all possible truth-values. We shall call the statement about the sun p and that about the wind q. We then find that the following combinations are possible:

p	q
T 1	1 T
T 1	2 F
F 2	1 T
F 2	2 F

*In the interest of readability we have varied from the standard punctuation of symbolic logic and omitted quotation marks from the symbols preferring the use of italics.

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The first line under the horizontal bar tells us that both statements are true. According to the second line it is true that the sun shines. But there is no wind. The statement *q* is false. From the third line we derive that *p* is false. There is no sunshine; but the second statement is true. The wind does blow. The last line finally informs us that there is neither sun nor wind. Both statements, *p* as well as *q*, are false. It is evident that the two columns give all possible truth combinations for the two independent statements. But now let us melt these two single statements into a compound statement, "the sun shines *and* the wind blows." That raises the question: in which of the above-described cases will the compound statement also be true? We write our compound statement in symbolic form, *p.q*, and now design a more comprehensive table which contains besides the single statements *p* and *q* also the compound elements, *p.q*:

p	q	p.q *
true 1	1 T	1 T
true 1	2 F	2 F
false 2	1 T	2 F
false 2	2 F	2 F

It is obvious that the compound statement, "the sun shines *and* the wind blows" can be true in one and only one case, namely if the sun as well as the wind are active. If there is no wind, then *p.q* is false. If there is no sun and only wind it is also false. The same applies if there is neither sun nor wind—in other words if p as well as g both have the value 2. The expression *p.q* is only true if *p* as well as *q* are separately true.

By means of this table a logically exact definition of the logical meaning of *and* has been obtained. This meaning is used by the electrical calculators if they "think" a conjunction. By the way, the same can be done for the meaning of "or" in the inclusive or exclusive sense, for "imply," for "is equivalent to," for "is compatible with," and for "neither-nor." There is no need for us to develop the truth tables of all these logical connectives. They can be derived from a combination of $\sim$ and *p.q*. The table of negation and the table "and" together represent the whole propositional truth-structure of Aristotelian logic. They are therefore sufficient basis to develop from there the entire propositional truth-structure of a non-Aristotelian logic.

*The double line means that the 3rd col. is a result of the first two cols.

OUR terran mentality is Aristotelian. There is no doubt about that. But sometimes we meet in life non-Aristotelian situations where our two-valued thinking fails to give us a proper answer. This story, told by an Indian logician, describes such a non-Aristotelian situation.

A Maharajah who kept a large game preserve for his private amusement was constantly troubled by poachers. Losing his patience, he proclaimed that every poacher caught by his guards would suffer capital punishment. Moreover, to add spice to his pronunciamento, the prince decreed that every delinquent facing execution should be privileged to make a statement. If this statement were shown to be true, the condemned man was entitled to beheading; if it proved to be false he should be burned alive. Presently the Maharajah's game warden caught a man shooting deer. On the day of execution the poacher was reminded of his privilege to make a statement. Cleverly he worded it as follows: "I shall be burned alive."

This perplexed the judiciary committee which was to rule on the truth of his statement. The judges were faced with an unavoidable dilemma: if we burn the poacher, then his statement turns out to have been true and he is entitled to a beheading. However, if we chop off his head his statement proves to be false and he should have been burned. At latest reports the committee was still deliberating.

The difference between the Sophistic

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trick-question and the Indian paradox lies in the fact that the former questions result from the misapplication of the formal rules of Aristotelian logic. It is very easy to rectify them. The dilemma of the condemned poacher on the other hand is not solvable within the confines of the classic logic of Aristotle. Moreover, it suggests a problem that has recurred within the modern mathematical theory of transfinite sets. So far there exists no genuine solution for it. Only some makeshift procedures have been instituted by dint of which it is possible to circumvent the awkward dilemma. (e.g. Bertrand Russell's theory of types). So far only one thing can be said with certainty. All attempts to solve this and other logical paradoxes point in a direction which leads us away from the Aristotelian mode of thinking towards a new system of trans-classical, non-Aristotelian logic. Let's pursue the train of reasoning which the Indian paradox offers us.

All Aristotelian logic is characterized by a very strict limitation. It cannot make any valid statements *except about past events*. Aristotle's system is, as we have demonstrated, a two-valued order of thought. Any statement subject to it is either true or false—and must be judged as such. It stands to reason that the strict alternative of the two statements:

"This event did take place"
or (exclusive)
"This event did not take place"

is only applicable to the past. As far as the future is concerned, this strictly dichotomic occurence pattern does not apply. A proposition about the future has only probability value. Its final and absolute truth-value remains in abeyance as long as the future remains the future. It should be added that the more a future event approaches the present, the more the probability range narrows down—but probably it remains till it passed the critical mark of the present. From then on only it can be said that it has taken place. . . . or not.

Now let us apply these reflections to the statement of the condemned poacher. He has stated, "I shall be burned alive." There is no way of verifying this proposition and establishing this truth-value before the execution has taken place. But the execution cannot take place before the statement has been verified, since the mode of the execution depends on the truth or falsity of the poacher's statement. The vicious circle is perfect.

There is indeed no genuine solution of the paradox on the basis of two-valued thought-processes. But let us take another look at this baffling problem. In view of this dilemma, the judges might decide that the Maharajah's stipulation does not apply to this case and consequently accord this prisoner an entirely different treatment. That might be anything from hanging to dismissal of the case and the prisoner's release. As far as the future is concerned, there now exists three distinct probabilities: 1) burning, 2) beheading, 3) something else. It follows the strict alternative of the two-valued logic of "to be or not to be" does not adeqautely cover the pattern of future events. Therefore we need at least a three-valued logic, and any statement about the future should be phrased according to the laws of such a non-Aristotelian system of logical thought.

It should be understod that a genuine third value must represent *a total rejection of the alternative represented by the other two values*. In Aristotelian logic the two values true (1) and false (2) mutually reject each other individually. Therefore, prisoner and judges alike are caught in the vicious circle.

In a three-valued logic there exists an additional rejectional relation apart from the mutual rejection of any two values. The following diagram might help. We add to our classic value a third value—3.

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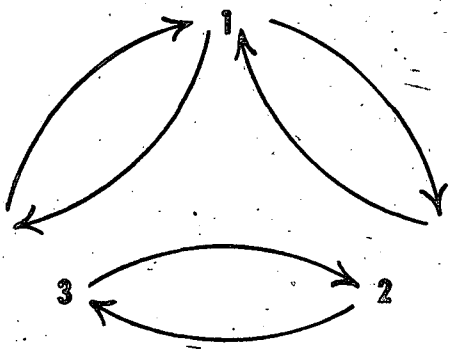
As this value rejects the preceding alternative of true and false, and so to speak displaces them, we shall call it the



displacement value and designate it with the number 3. But what does this number mean? Don't try to understand it! I, the professional logician do not know, either. We don't have to. As we will later see that becomes the function of the mechanical brain. The following triangular pattern of the values is only meant to show you the increasing complexity of a three-valued relationship of logical concepts.

We then discover an interesting sequence of values. First 1 ("I shall be burned") is rejected and we proceed to 2. Then 2 is rejected also. In a two-valued logic this would inevitably lead us back to 1 and we would have entered the vicious circle. But now the situation is different. Apart from the mutual negation (rejection) of 1 and 2 there now exists an analogue relation between 2 and the new value, 3. That means there is a logical choice for our argument. It can either return from 2 to 1, thus completing the two-valued paradox, or it can also proceed from 2 to 3. In fact, this latter course is exactly what will happen. It will happen for the following reason: 1 has already been rejected, and 3 has not, so far as our paradox is concerned. In other words, 3 now occupies a position of logical preference.

But what does 3 really mean in terms of our Indian paradox? According to our convention, 1 indicates the burning, 2 stands for decapitation. In order to find out about 3, let us take another look at the diagram. If we do so we shall discover that 3 does not only reject 2, it also rejects 1 and is in turn rejected (negated) by both classical values. This produces an entirely new rejectional relation. 3 not only rejects 1 and 2 individually, *it rejects*, moreover, *the whole alternative which is represented by the mutual opposition of 1 and 2*. To put it differently: 3 not only rejects the contrasting features of 1 and 2, it also negates that which the first two values have in common. Burning and beheading indicate different choices of capital punishment. And, since 3 rejects the alternative of 1 and 2, it negates not only the individual instances of burning and beheading but it rejects their common denominator—capital punishment.

IT IS logically impossible, therefore, that 3 might mean hanging. This is implied by the first and most basic law of any three-valued logic. First find out what the common denominator of the first two values is—in other words the general basis upon which they negate each other—and then deny this very basis. But you might well ask: is it always possible to determine the common denominator? You are quite right, that is where the difficulty comes in and why a three-valued logic is a matter for somebody else, but not for us.

There must be some reason why we humans use the Aristotelian logic although it has a very limited scope and cannot deal with certain problems.

Let us go back once more to our Indian paradox and try to find out why this is so. We noted that the common denominator for burning and beheading was supposed to be capital punishment. But why not just punishment? It should do as well. In this case the third value would represent non-punishment and the prisoner might expect a complete pardon. But why not generalize even more and simply say: some action by the committee. This might lead to a bonus for the poacher or even a reward for having pointed out an essential flaw in the directive of the Maharajah. In fact, there

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is no limit to this trend of generalization. We might as well go to the limit and say that the common denominator of burning and beheading is that both are events in the world. However, as the 3 value negates the common denominator we should arrive at the idea of "no event" as last solution. But where does that leave the judge or the prisoner? Neither of them could ever go home because that too would be an event.

This clearly shows that there is no point for us in adopting a three-valued logic because it works only if the scope of the alternatives that are used in its system are arbitrarily limited. On the other hand a logic misses its purpose altogether if it does not permit us to produce statements of any degree of general validity. There is one alternative of absolute generality the human mind is capable of. It is contained in Shakespear's famous line: "To be, or not to be—that is the question."

Undoubtedly that line contains the most radical two-valued alternative that could be thought of. Let us try to add to the positive value of "being" and the negative value of "not being" a third non-Aristotelian value. We know the procedure now. First we have to find the common basis for "being" and "not being" and then reject the same. The ensuing result should provide us with the meaning of the third value. But what is the common denominator of "being" and "not being", i.e. of "something" and "nothing"? There obviously is no common basis. You may rack your brain till doomsday. You will never find a mysterious essence that "being" and "not being" have in common. They are total negations with no common bond.

"To be, or not to be—" that is the final question that takes precedence over everything. The comprehensive scope and the generality of Shakespear's alternative can never be surpassed. There is, therefore, no third value on that level. The two-valued, Aristotelian logic reveals itself as the most general form of thinking of which the mind is capable.

In my first article "The Seetee Mind" I have demonstrated that man is incapable of thinking except with an Aristotelian logic due to the peculiar energetic (electric) qualities of physical existence. The present article shows that there are also purely logical reasons which confine terrestrial intelligence to the two-valued pattern of rational thought. Yet we have seen that even in human existence there are certain situations and aspects which are not covered by the Aristotelian mode of thought. The Indian paradox demanded a three-valued, non-Aristotelian technique of thinking. It is evident that such a technique exists, but we were not able to fit it systematically into our habits of reasoning.

The possibility of many-valued, non-Aristotelian systems of logic is to date a scientifically established fact because the various calculi which would correspond to the mental activities of a non-Aristotelian intelligence have already been workd out. Still the spiritual (rational) life of Man does *not* conform to non-Aristotelian patterns. This too can be accepted as an established fact. Obviously somewhere something is missing in our present conception of the relation between *man* and *cosmos*.

The mystery deepens if we reflect upon the possible opposition of an-Aristotelian and a contra-Aristotelian mind. My preceding article developed the thesis that a seetee mind would represent a total negation of our own. Let us try to follow that argument a bit further. Shakespeare gave us the formula for the total opposition of the two values. It is the disjunction of "to be" or "not to be." If that is so, then all our rational concepts define "being." Reversely, all concepts in a contra-Aristotelian mind should designate "not being." Even more: the seetee mind is *for us* "not being!" All right, if something does not exist why should we go to any trouble about it. I am afraid we must, because there's an awkward twist to the matter. What we have just described is the one-sided terrene viewpoint. Seen from the contraterrene angle the shoe is entirely on the other foot. For the seetee mind

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only contraterrene mentality represents "being" and Aristotelian thought pattern is the clear index of non-existence.

The relation is mutual: the Aristotelian and contra-Aristotelian mind simply do not exist for each other. But somehow they *must* co-exist—if contraterrene matter is a physical reality. The reason is obvious: a mind may ignore the existence of another mind, but terrene matter cannot ignore the physical reality of contraterrene matter if both happen to collide in space. Then the whole show goes off with a bang. You certainly cannot expect more positive recognition of one's own total negation.

Therefore, *if* seetee matter exists, then the reality of the contraterrene mind is also implied. We shall probably never contact a seetee mind physically because between its realm and ours yawns an existential void where only mutual self-annihilation of physical matter governs the rules of a possible encounter. But there exists a 'Third' in this creation beside Matter and the nergetic Mind: it is Information.

Information can bridge the cosmic gulf. This, however demands the design of a brain that stands halfway between the terrene and the contraterrene intelligence. Only a robot brain could do that. An artificial brain with a non-Aristotelian thought pattern. A brain of that type is theoretically possible. My next article will explain how it works.

SCIENTIFIC INSTRUMENTS QUIZ

LISTED below (in jumbled fashion) are the names of 12 scientific "instruments," together with a brief description of each. Can you match up at least 8 of them correctly for a passing score? 9-10 is good; 11-12 excellent.

1. SEXTANT	(a) an instrument for determining the density of specific gravity (especially of liquids).
2. GALVAMETER	(b) one for measuring curvature or radii of globular surfaces.
3. ALTIMETER	(c) one for making an automatic record of an earthquake shock.
4. SPECTROSCOPE	(d) an instrument for indicating atmospheric pressure (used for weather forecasting, measuring elevations, etc.).
5. SPECTRO-HELIOGRAPH	(e) is used for measuring angular distances (as in determining latitude at sea by taking the sun's altitude at noon).
6. BOLOMETER	(f) one for measuring vertical angular elevation.
7. SEISMOGRAPH	(g) one of several surveying or astronomical instruments for measuring horizontal and vertical angles.
8. NEPHOSCOPE	(h) an instrument for photographing the sun with its prominences.
9. SPHEROMETER	(i) an apparatus for measuring (electrical) current-strength.
10. THEODOLITE	(j) one used for the measurement of minute differences of radiant heat.
11. HYDROMETER	(k) is used for forming and analyzing the spectra of the rays emitted by bodies or substances.
12. BAROMETER	(l) an instrument used in the observation of clouds to determine their direction, velocity, elevation, etc.

(Answers on Page 129)

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Illustration by
DAVID STONE

SUMMER HEAT

By SAM MERWIN, JR.

There was going to be
a hot time in Leithton
when the women found out
what Rusty Farnum was up to!

HILDE wasn't exactly surprised when her boss, Dr. MacLean, came bustling out of his office and said, "Miss Schmidt, will you run over to Rusty's and get this prescription filled?"

She laid aside the pencil with which she had been doodling various dimly Freudian scrawls, got up from behind her desk and tugged her white uniform

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into shape. There was a so-what air about her routine gesture. Not being a fool, Hilde knew she had a smashing figure. Unfortunately there was simply too much of it.

She looked down at Angus MacLean's square but unexpectedly sensitive face and lifted one perfectly arched eyebrow significantly. Although there were a number of people in the waiting room, sitting apprehensively in wooden chairs along the walls and leafing crumpled magazines, Dr. MacLean's face became bright red.

He said, obviously irritated, "See that it's filled," and thrust the prescription into her hand, started back to the inner office.

Hilde murmured, "Oh, no!" and he turned and looked at her with bristling inquiry. She said, "Nothing, Dr. MacLean," mentally kicking herself hard for acting smart and getting the doctor annoyed. Things were bad enough already without making them worse.

She smiled vaguely at the waiting patients, not really seeing them in her abstraction, and told them the Doctor would take them in turn in case she wasn't back in time. Then she went from the fan-cooled heat of the office into the airless heat of Oak Street.

She had not gone a hundred feet before she could feel a trickle of sweat running down her spine. The summer, she thought, was hot even for Leithton—hot and dusty except for sporadic thunderstorms that alone managed to stave off the threat of drought.

Ferris Courtney drove slowly past in his new yellow convertible and even newer blue-and-yellow sports shirt. He called out, "Hi there, Hilde—howzit up where you are—cool?" and showed a flash of white teeth below his dark glasses.

Hilde, who was long since resigned to being kidded about her six feet one, said, "Hi, Ferris," and went on her assigned way.

She shouldn't have lifted the eyebrow at Angus—she called Dr. MacLean by his first name in her thoughts. She didn't want him angry at her—quite the reverse. With typical self-honesty Hilde admitted her passion for her employer, which had burst into frustration when he had first come to Leithton two years earlier and hired her as his nurse-assistant. Stooge, she thought, was more like it.

Yet the situation was incredible—fully justifying a lifted scalp to say nothing of a lifted eyebrow. From Angus's quick blush, from his sending her out of the office during the consultation, the answer was as evident as it was impossible. Sarah Gillis, Leithton librarian and spinster of thirty years immaculate standing, was caught!

Sarah Gillis—whose idea of a modern deodorant was a bit of sachet in her bureau drawers, whose life had been as innocent of beauticians and lipstick as it was of men! Sarah Gillis—whose rigorous pruning of current best-sellers kept most of them off the library shelves and whose uncompromising attitude toward youthful spooners in the library stacks had long been a town joke.

IT MIGHT have been funny, Hilde thought, if it didn't contain the seeds of tragedy—for if Sarah Gillis was married no one had heard of it. And Sarah had spent every day and night in Leithton since her trip to a librarian's convention in Chicago six years before.

Hoping the heat would not wilt all the starch from her white uniform, Hilde paused at the intersection of Oak and Grange, where Leithton's one traffic officer, big Rupe Plezewski, fanned himself by spinning the stop-and-go sign above his booth.

Rupe was big enough for Hilde—but she felt she had to draw the line somewhere, even in Leithton. And Rupe, with his broken nose and teeth, his uncertain complexion and utter lack of intellect, was definitely beyond the pale. Besides, he was taken.

Nevertheless he leered at her and said, "Hot, ain't it, Hilde? When we gonna get together, honey?"

"When you produce a written permit

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from Bridget." Hilde told him, enjoying the resulting sudden deflation.

She crossed the dusty intersection, hoping her white shoes would not be irretrievably dirtied and wondering a little at what was happening to Leithton—or rather to the women of Leithton. Like all other small communities—and large ones too—the little Midwestern town had its share of scandals, secret and otherwise. As Dr. MacLean's nurse, to say nothing of Connie Harris's roommate, Hilde knew.

But not even in the course of her nurse's training had Hilde heard of anything like what had happened and was continuing to happen to the women of Leithton that summer. The national birth-rate might be leap-frogging upward, as articles in Angus's medical journals frequently stated—but it fell far behind the sudden spurt of pregnancies in Leithton. As she pushed open the swinging door of Rusty Farnum's Snowdrop Pharmacy on Grange Street, she wondered if maybe the protracted heat wave might not have something to do with it.

Once inside the store she stopped thinking entirely and let the air-conditioned coolness wrap its almost sensual chill around her. As her eyes grew accustomed to the dim light she noted that as usual, even at two o'clock in the afternoon, the booths and counter were well filled. Getting his air-conditioner in this spring was the smartest business move Rusty had ever made.

Since most of the men in town were working in field or office, the bulk of the customers were of Hilde's sex. She nodded to one group of housewives, who should have been watching their Bendixes, flipped a salute to Dody and Didi, the cute brunette-banged Springer twins, and went to the drug counter, handed the prescription to Rusty.

"Another one, eh?" said the druggist, scanning the deliberately illegible scrawl on the piece of paper in his hand.

"Rack up another," said Hilde. As always she felt, while watching Rusty turn to go about his business, a semi-personal pang of pity with which was mingled a barely-suppressed desire to giggle.

Not that Rusty Farnum looked ridiculous. Six feet tall, built like the proverbial Greek god, a born athlete of not too early vintage, he might perhaps have done well as a Hollywood leading man. During the period of his football stardom at the State University there had even been some talk of a Hollywood career.

Hilde was one of the few who knew what had actually happened to cause Rusty to settle down as a pharmacist in his home town. A combination of carelessly placed pads and the fateful cleats of a big Conference tackle had summarily removed Rusty from the ranks of practising men. He was, in short, interested but ineffectual.

That this fact was not generally known in Leithton was, Hilde felt, a tribute to the integrity of the medical profession. She had heard it by accident from a garrulous young interne who had imbibed too much at her graduation celebration. And, in accord with her dislike for gossip, Hilde had kept her mouth shut.

NATURALLY, in the course of the years that followed, there had been whispers about Rusty. Women had wondered—and so had men. But none of them *knew* anything. And Rusty, by simply going about his business, was not only piling up a modest fortune, but was also becoming something of a power in the town councils. Hilde admired him, had more than once in the pre-Angus period of her life, felt a certain amount of resentment at the accident which had so irretrievably put Rusty out of the running.

While she waited, reveling in the coolness of the air-conditioning, for Rusty to fill the prescription, Abby Weston entered the store and approached the magazine rack. And, although Hilde disliked such emotions, she felt resentment amounting to hatred rise within her.

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Abby Weston was heir to the Leith Feed Produce Corporation, and, as such, heir to Leithton itself. That, without trying, she should have acquired the devotion of Angus MacLean seemed to Hilde to amount to something akin to monoply in restraint of trade.

She couldn't really blame Angus either. For Abby Weston was a lot more than rich—she was petite, pert and pretty and her shorts-and-halter-clad figure was slim if lush perfection. Somehow even the undisputed facts that she was utterly spoiled and as deep as a disc seemed only to add to her arsenal of attractions.

She said, "Hi, Hilde, how's bedpans?" and went on looking at a large glossy decorator's magazine without troubling to heed any reply Hilde might have made but didn't.

Then Mrs. Leith Weston came barging in and Hilde felt a mite better. In the bulging tuberosities of the mother could be seen definite presagement of the Abby Weston some unlucky man would one day find sitting across an overglazed mahogany breakfast table. She was all flouncy flowered-print dress, sweat-streaked face powder and pursed petulant little mouth.

She said, "Morning, Hilde." Then, "Abby, don't waste time goggling at magazines. We have a date with a hairdresser."

"Let her wait," was the daughter's response. "She won't dare let anyone in ahead of us."

A fine uninhibited argument was getting under way, to the delight of the other customers, when Rusty emerged with the prescription. Anxious to reach a more peaceful, if hotter, locale, Hilde took it and turned to go but Rusty held her there. He said, in low voice, "Funny business, isn't it, Hilde?"

"Not exactly funny," said Hilde. "I'm scared."

"Must be a real Casanova in town," said the druggist. He seemed to be enjoying the predicament in which such an outrageous number of Leithton women were finding themselves. And, considering everything, Hilde couldn't really blame him.

But she said, "Watch yourself, Rusty," and went on out. In the doorway she almost bumped into a wretched-looking Sarah Gillis, evidently fresh from her dismaying interview with Angus. Hilde said a bright "hello," but poor Sarah could only blush and stammer. Outside the heat hit Hilde like a bulldozer blade.

Back at work she resumed her place behind the foyer desk until Angus finished with his final patient for the day. Then she went into the office, took off her cap, lit a cigarette. She said, "Angus, I'm worried—you sure about poor Sarah Gillis?"

He nodded and stirred restlessly on his corner-of-the-desk perch. "No doubt about it," he told her. "The poor old gal's in her third month." He paused, added, "The hell of it is she's still technically a virgin!"

Hilde all but dropped her cigarette. "You're joking!" she said.

Dr. MacLean shook his spaniel-red head conclusively. "Hardly!" he told her. "But after all, the condition is not exactly rare in the annals of medical history. You know as well as I—"

"—that you're trying to kid both of us, Angus," she said. "*I* know Sarah Gillis if you don't. What's more, it fits into the rest of the picture. Something's gone haywire in this town."

HE SIGHED and refused to meet her eyes. Then he said "I don't want to face it, I guess. It doesn't make sense. Who ever heard of one town getting twelve miraculous births at one swoop? Nobody! Yet that's just what these women expect us to believe."

"Poor Sarah seems to be the clincher," said Hilde quietly.

Dr. MacLean looked at her despairingly. Then he slid off the desk and said, "Let's close up shop before the phone starts ringing."

"Got a date?" Hilde asked him.

"Yeah—with Abby," came the expected reply. Hilde was on the point of

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telling him he was going to have a nice long wait before the arrogant Abby got through at the hairdresser's, then decided to let him sweat it out. If he was dumb enough or mercenary enough to fall for Abby he rated what was coming to him.

As he was locking up, Angus turned to Hilde and said curiously, "You're okay, aren't you, Hilde?" Then, reddening, "I mean, I should think with what's going on you'd be a prime target."

"Thanks for the pornographic consideration," Hilde replied evenly, fighting down a desire to belt him over the head with her shoulder-bag. "I'll treasure it to my dying day."

For such a steaming hot afternoon their parting was very cool.

When she got back to the over-a-garage apartment she shared with Connie Harris, Hilde discovered her roommate stretched out flat on her blue-tufted candlewick spread, absolutely nude, reading a movie magazine and sipping beer from a bottle. Connie was a medium-sized girl with a lean, sexy figure, heavy brown hair she could set merely by running a comb through it, and a wealth of nervous vitality.

Hilde never had quite figured out how she had come to let Connie move in with her. Connie violated every tenet of the code by which Hilde sought to live. She was utterly selfish, utterly unscrupulous and had the morals of a Barbary ape. As personal secretary—and if gossip meant anything considerably more personal than secretary—to C. Leith Weston, president of the Leith Feed Produce Corporation, her salary was probably twice that of Hilde's.

But Connie was engagingly open about her flaws and intensely likeable withal—and she had a way of getting what she wanted. She had wanted to live with Hilde, had said, "Honey, unless you put me up with you I'll be marked lousy in this town and Mrs. Leith Weston will run me right out of a job as her hubby's secretary. How about it?"

And Hilde had said, "I guess it's all right." And somewhat to her surprise it had worked out reasonably well. If Connie was seldom at home except to sleep—and not always then—Hilde didn't mind being alone. And when Connie was home she offered an inherent gay iconoclasm that Hilde found more entertaining than shocking.

She said, "Peel and stay hot, why don't you, honey? This afternoon is pure assassination."

"It's an idea," said Hilde, knowing herself too modest to dispense with all her clothing.

Then, "I was at Rusty's a while ago. It's cool enough there."

"I know," said Connie. She turned over on her side, regarded her roommate speculatively, added, "In the first place I'd have to get dressed. In the second place Rusty doesn't serve beer. And in the third place if I sat around there very long I probably would be assassinated for real. The women in this town hate my guts."

"With cause, no doubt," said Hilde, peeling down to bra and pantie-girdle and flinging herself on her own bed—which was as hot as if it had been left out in the sun.

"With or without," replied Connie, and there was a bitterness in her tone that caused Hilde to sit up and stare at her.

"Something wrong, Connie?" she asked.

"That depends on how you look at it," Connie stated, reaching for a cigarette. "Some people claim it as woman's greatest experience."

Hilde sat frozen with shock. Then she whispered, "Not you, Connie! I thought you knew the ropes."

"*And* the percentages!" countered the dark-haired girl. "I thought I knew them too. But something is definitely not right in my personal Denmark."

"How long have you suspected?" Hilde asked her.

"Three weeks," was the reply. "There's no doubt about it, honey. And the hell of it is it *couldn't* have happened then."

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CONNIE looked at her so defiantly that Hilde said, "I believe you, Connie. There's something very peculiar going on in Leithton."

"That's the understatement of the year," replied Connie. "What in hell am I going to do about it?"

"Don't ask me," said Hilde. Then, "And don't get scared."

"Who's scared?" countered Connie. "I'll manage things somehow. It just makes me mad when I see all the stupid woman in this town who take chances all the time and never get caught. And here I am, who never takes a chance, and I'm caught and I don't know how."

"I'm sorry, Connie," said Hilde, but her thoughts were elsewhere. She was thinking of all the women in town who seemed on the way to having babies that were not only in most cases unwanted but were unsuspected. There was Connie, of course—and poor Sarah Gillis, both the pretty Springer twins and at least a dozen others.

She was puzzled, not only that the same thing should have happened so unaccountably to so many of them, but that it should have happened to these particular women at all. Somehow she couldn't believe all of them had, according to the local pulpits, sinned simultaneously. She believed both Sarah and Connie and that caused her to eliminate the Casanova theory. No one man—not even Ferris Courtney—in one small town could have such widespread and simultaneous conquests.

She studied Connie, lying on the bed, and wondered. . . .

"Something eating you, honey?" Connie asked. "I haven't come down with measles or leprosy, you know."

"It's not that," Hilde said quickly, embarrassed. "It's just that I was getting a sort of an idea."

"That's bad," said Connie, going back to her movie magazine.

The next morning, at the office, Hilde was going over the case histories when Angus walked in. He grunted a "hello" and sat down, looking wretched. Hilde finished her survey, put the cards in a stack on his desk, said, "You look like the relic of a happy evening—"

"Oh, shut up!" he told her. Then, with a wry smile that played on her heart-strings like a steel guitar, "It's that damned lightweight, Ferris Courtney. He kept horning in on things last night."

"And quite a horn he's got on that new yellow convertible of his," said Hilde with carefully masked derision. She wanted to add, "Why don't you snap out of it, you goon? Abby's the lightweight, not Ferris. She'll dust you off every time she feels like it, just to see you squirm." Instead she said, "Look at these cards. I've marked them."

He flipped one over, said, "Hmmm, the problem again," looked at them idly, then with increasing interest. Finally he glanced up at her and said, "This doesn't make sense, you know."

"Sure, I know," she replied with a sigh, "does any of it? There aren't any points of similarity except height. All the cases run between five feet two and five five. You're the doctor, Angus—you figure it out. I'm just setting up the pins in the alley."

"Don't be so damned flippant," he growled at her as she left him for her own desk in the anteroom. She was idly marking down data on a case history an hour later when Mrs. Leith Weston came barging in, resplendent in a flowered puce gown, with Abby trotting at her elbow and a meek harried C. Leith Weston bringing up the rear.

Hilde knew better than to try to tell the Leith Westons of Leithton that the doctor was busy. She pressed the emergency buzzer and rose with as much smile as she could muster. Mrs. Weston cast a glance at her that should have worn lorgnettes, said, "We have very little time, Hilde," and pushed on past with her daughter. Then, as C. Leith made a move to follow, "Wait here for us, Charles."

The harried little man collapsed into a chair and looked at Hilde hopelessly, like a homeless hound. Regarding him she wondered how Connie could have

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any interest in such a rabbit of a man, decided she still had a lot to learn about her roommate.

THIRTY uncomfortable minutes later the Weston women came out. To Hilde's amazement Abby's dark eyes were even larger than usual and her over-rouged mouth smaller. She looked scared sick.

Her mother, on the other hand, looked like a cow-elephant on the verge of going berserk. Her nostrils were dilated and her breathing sounded like the noise made by a pipe in need of cleaning. She cast a withering eye at her shrinking husband, said, "Come along, Charles," in sepulchral tones that suggested her intention of escorting him to the nearest scaffold for execution.

The Weston family departed and the buzzer rang on Hilde's desk. She went inside to find Angus in a state of near collapse, sunk in his morris chair. He said, "Well, there goes your theory."

"Oh, no!" exclaimed Hilde, feeling a trifle groggy herself. "Not Abby Weston?"

His nod was grim as he told her, "Yes, Abby—*and* her mother!"

"B-buu-but—" stammered Hilde, sinking into a chair herself.

"Both of them," Angus repeated grimly. "At first Mrs. Weston thought it was something they'd eaten. Then she decided differently."

"What about Abby?" Hilde asked. "How did she account for *her?*"

"She seemed to think *I* might have had something to do with it," Dr. MacLean said grimly. "Abby herself put a stop to that."

"Poor Angus!" said Hilde, trying not to laugh.

"It was hot for a bit," he replied with his wry smile. "But this is getting out of hand. If your theory about only women of a certain height getting pregnant is right, how do *you* account for Abby? Her mother's within the limits, but Abby's only five-feet one."

"It's got me!" said Hilde, flabbergasted. Then she sat up and said, "Wait a minute, Angus—she wasn't wearing them just now, but Abby's been building up her height a lot this summer with platform sandals. I know—I saw her in Rusty's with them on just yesterday."

Angus nodded, then started. "But that's insane!" he exploded. "How could what a girl wears get her in that condition?"

"Don't ask me," countered Hilde, "but I'll lay odds I'm on the beam. Just call it woman's intuition."

"Oh no—not that!" he exploded, and Hilde went quietly back outside.

She thought about it all the rest of the day. Maybe it didn't make sense, but neither did anything else. And about four o'clock in came Bridget O'Neill, who baked bread and pastry for the town in the Leithton Bakery. Bridget was red-faced and angry when Dr. MacLean gave her his verdict. Some of her comments caused even Hilde to blush.

Finally she said, "And it all started because I used to pass the time of day with him before goin' into Rusty Farnum's for a double-chocolate malted!"

Something like a gong rang in Hilde's head. There was one other item all the afflicted women seemed to have in common! Aside from their height and visits to Dr. MacLean—they were all more or less habitués of Rusty's! But this, Hilde thought, probably meant less than nothing—such a roster would include almost all the women in Leithton. Still, it was a fact of sorts.

WHEN she got home she asked Connie about it. Her disillusioned roommate propped herself up on the pillows, laid down her confession magazine and said, frowning, "But I haven't been in Rusty's much for the past month. Haven't felt like looking a banana split in the eye."

"But you *were* there before?"

Connie nodded, said, "So what? Rusty can't make me pregnant just by looking at me—or any other way either, if what I hear is true."

"That's just gossip," said Hilde sternly.

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"Oh yeah?" was the cynical rejoinder. "Where there's no smoke there's no fire—if you know what I mean."

"But when you did go there," Hilde insisted, "Did you feel or hear or see anything peculiar—even the littlest thing?"

Connie shook her head and sighed, then frowned again and tried to remember. Finally she shrugged and said, "I dunno—except that I seemed to feel that air conditioning of his go right through me when I went in or out. But it always does. . . ."

"Funny," mused Hilde, frowning in turn, "that's what *I've* been trying to remember—there is a sort of sharp feeling inside when you enter and leave the store."

"Oh, we've got enough holes in our heads already," was Connie's reply. "You going to wear those zircon clips tonight?"

"I don't think so," said Hilde. Then, curious, "Why—you're not going out on a date tonight, are you?"

"Honey," said Connie, stretching lazily and sitting up on the bed, "when you're in my condition you might as well be hung for a sheep as a lamb. I'm going out with Ferris Courtney."

"I thought you hated him," said Hilde.

"Hate," said Connie sagely, "makes good protective armor."

Hilde handed Connie the clips, saying "If you can't be good, don't bother being careful," and walked out. Intuition or not, she had an increasingly strong feeling she was right about the wave of Leithton pregnancies. Maybe it didn't make sense—but what did?

She walked the three sweltering blocks to Grange Street, and waved a hello to Officer Rupe Plezewski, as she approached Rusty Farnum's pharmacy. She paused for a moment on the threshold, holding the door open. A glance at the door frame showed her a little rectangle of glass, just below the metal rimmed indentation of the bolt-holder. And as she stood there she felt a bolt of icy coolness transfix her body from hip to hip.

Someone cried, "Shut the door, Hilde, before we melt!" With an apologetic smile she went inside to a counter stool, ordered a chicken salad sandwich and a vanilla malted. And while she waited she looked covertly at the doorframe, wondering.

Immediately above the door was the air-cooler's enigmatic box, below it some metal-cased machinery immediately at the side of the door where she had spotted the bit of glass. Why, she wondered over her food, should there be a thick, vertically rectangular window in the side of the door itself? Like the rest of it, it didn't make sense.

Rusty, as usual, was back by the drug counter, dispensing medicine, cigarettes and making change on the cash register. In the deliberately dim light of the store it was impossible to read his expression clearly. Yet it seemed to Hilde, when once or twice he caught her eyes on him and nodded, that the erstwhile football star was wearing a certain new smugness. Or it might have been imagination.

Following her hunch, Hilde went back to the office. She recalled an article she had casually noted in a recent medical journal, dealing with induced parthoenogenesis under laboratory conditions among female rats, rabbits and hamsters. Tonight her interest was no longer casual.

SHE found the article after ten minutes' search, read it with mounting apprehension. Apparently it was possible to induce pregnancy in female animals without fertilization by a quick-freeze of the Fallopian tubes during a brief time of ovulation.

Hilde felt sick as she put down the magazine. The rectangular bit of glass in Rusty's doorway, the deep-chill she and Connie and certainly the others had felt while passing before it, the undoubted abilities of Rusty Farnum as an unlettered scientist, coupled with the frustration of his normal paternal urges —all began to assume a monstrous if entirely understandable pattern.

What, she thought, if that glass rec-

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tangle actually concealed some sort of electric-eye beam that projected some sort of reverse diathermy? In that case virtually every female whose ovaries passed within its compass was liable to become pregnant—especially since the women of Leithton had been using the pharmacy all summer as the town's sole air-conditioned spot.

She reached for the phone and called Angus's number, feeling an uninduced chill at the possible consequences of Rusty's experiment. And, of course, Angus didn't answer. For a moment she considered calling the Westons and asking for him—then decided against it. She had no desire to brave the frigid snobbery of the Weston women, even to impart such world-shaking news. Besides, she thought, she was probably building a theory on very thin sand.

But Hilde had to know. After smoking a couple of cigarettes, she turned off the lights and went back to the drugstore. As it was early-showtime and a new Pa and Ma Kettle feature opened that night, the store was empty save for Rusty and a pimply-faced soda clerk, who was conversing in low tones with a pony-tailed, denim-clad ingenue at the front end of the counter. Hilde suppressed a desire to tell the maiden to get the hell out of there quick.

"Rusty," she said when the druggist approached her, "don't you think it's time you took that damned electric eye out of your door before you get yourself lynched?"

He said, "What are you talking about, Hilde—the heat got you?" But his eyes shifted under her steady gaze.

She said, "You know very well what I'm talking about, Rusty. You've got a quick-freeze beam of some kind working through that eye and you've made at least a score of women in this town pregnant with it. If they ever find out—"

He looked frightened, gripped her wrist in a massive hand, said, "You won't tell, will you? It's one of the most important experiments in the history of science. Think of it, Hilde—women having children without husbands!"

"Yeah," said Hilde sternly, "*you* think of it. Who's going to take care of them while they have them? Who's going to take care of the children? Who's going to straighten out their husbands and boy-friends and—" with a look at the child by the counter—"their parents?"

"Honest, Hilde, I never really thought it would work," he said "I've been reading about these experiments with animals and I guess you know I can't have children myself. I wanted to do something for the world, outside of just standing here filling prescriptions. So I rigged up the eye when I had the air-conditioning put in."

"How'd you work it?" Hilde asked, both appalled and fascinated.

"You know about diathermy—and black heat," said Rusty. "You use those machines with Doc MacLean. Well, I rigged one of them back of the door-frame behind the window and put it together with a refrigerating coil to make it cold instead of hot. Honest, Hilde, I never really expected it to work. and when it did I had to continue to make sure it wasn't an accident."

"The only accident that's going to happen around here will probably happen to you," said Hilde sternly. "You realize the whole business is criminal, don't you?"

"I didn't—not at first," he said. Then, again gripping her wrist, "Hilde, you won't tell! I'll take it out tonight—honest."

"You rate everything that may happen to you," said Hilde, feeling sorry for Rusty in spite of everything. "I'll have to tell Dr. MacLean, of course. Otherwise—"

A crash from the magazine rack interrupted her. She and Rusty jumped and turned as a slender female figure darted sobbing from concealment and made a successful bolt for the door. Rusty looked at Hilde, horrified, whispered, "Who—who was it?"

"Sarah Gillis," said Hilde grimly. "She's one of the women you've caught in this experiment of yours."

"Ohmigod!" exclaimed Rusty. "Get

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out of here, Hilde." Then, to the others. "I'm closing up early tonight."

OUTSIDE Hilde felt the watery aftermath of fear. She hadn't been aware of being afraid while she was talking to Rusty, but now that she was away from him her knees were weak, her diaphragm saggy. She realized how foolhardy she'd been. Under the circumstances Rusty might have killed her—after all, she was the only one who'd guessed his secret. But now there was poor Sarah to think of as well.

Hilde walked home, still overwhelmed with what she had discovered. If Rusty Farnum, by merely rigging an electric-eye gadget to his door, was able to make pregnant an unknown number of Leithon women, she wondered what some dictator or other ruthless tyrant would be able to do to the women of his population—to say nothing of his birth-rate. Horrible thought. . . .

Thus abstracted she walked slowly up the steps to her over-a-garage apartment, entered and turned on the light. There she stopped and blinked in surprise as Connie and Ferris Courtney, who had been sitting in the darkness on Connie's bed, said, "What are you two doing here?"

Connie sprang for the light-switch, turned it off, said, "Don't be funny, Hilde! The police are looking for Ferris."

Hilde groped her way to a chair, sat down. "Why?" she asked.

"It's Mrs. Weston," said the playboy of Leithton viciously. "She claims I've got her precious daughter in trouble. She wouldn't even let me kiss her!"

"Cheer up," said Hilde, "Abby's pregnant, all right."

"What! exclaimed Connie and Ferris in chorus.

"And so's her mother—"

"That old bag?" cried Ferris incredulously. "Oh, no!"

Hilde said, "Take it easy, Connie—Ferris didn't do it. Unfortunately I can't tell you who did."

"Then why are they blaming him?" cried Hilde's roommate.

"Because they can't think of anyone else to blame," replied Hilde. Then, "Why are you hiding out here? Why not get in your car and take off for the far hills, Ferris?"

"In that yellow fire-engine of mine?" Ferris countered. "They'd spot it in an hour. I'm sorry, Hilde, but this is only for a little while."

"They'll never look for him here," said Connie.

"Where did you leave the car?" Hilde asked.

"In my garage," said Ferris, "as soon as we heard Rufe and the Westons were out looking for me."

"Who told you?" asked Hilde remorselessly.

"The guy at the filling station," said Ferris.

"Yipe!" Hilde groped for a chair, sank into it. "In that case they'll find out you and Connie were together, which means they'll—"

"What'll I do?" whispered Ferris as footsteps sounded outside. Hilde debated telling their visitors there was nobody home but us chickens, decided against it and turned on the light as a heavy knock sounded at the door.

IT WAS quite a delegation. The inflated Mrs. Weston headed the parade, followed by red-faced Rupe Plezewski, with Angus, Abby Weston and Mr. Weston bringing up the rear. Before they could speak Hilde said, "Angus! What are you doing in this?"

"He's going to help us see justice is done my daughter," cried Mrs. Weston angrily. Her face was the color of borscht. "We know Ferris Courtney is skulking in there."

"I am not skulking," replied Ferris, appearing at Hilde's side, his arm around Connie. "And I'm not guilty of anything."

"Oooh—shameless!" exploded Mrs. Weston at sight of Connie. And to Officer Rupe Plezewski, "Policeman, arrest him!"

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Rupe made a move to seize Ferris, but Hilde barred the way. She said stoutly, "If you take one step inside this apartment without a warrant I'll have you up on charges of breaking and entering."

Rupe hesitated, then moved forward, mumbling unhappily, under the spur of Mrs. Weston's demand for action. Hilde put a firm hand against his chest and pushed. The big officer staggered backward into Mrs. Weston and the two of them fell backward down the steps, with Angus, Abby and Mr. Weston barely getting out of their way. Mrs. Weston landed atop Rupe with all of her 190 pounds and Hilde could hear the breath leave his body.

"You shouldn't have done that," Angus told Hilde reproachfully.

It was the final straw. Hilde's slow temper finally burst its rigid bounds of self control. She said, "If you were enough of a doctor to know what's going on in this town you'd know Ferris Courtney isn't guilty of anything more than trying to have a good time—innocently!"

"What do you mean?" Angus asked, startled, while below Mrs. Weston and Rupe slowly untangled themselves.

"I'll tell you in private," said Hilde. "But the guy you're looking for is Rusty Farnum."

"Rusty!" gasped Abby Weston. There was a long moment of appalled silence.

Then Mrs. Weston, looking faintly like Teddy Roosevelt at San Juan Hill, pointed fiercely at Hilde and said, "Officer, go up and arrest that man and that woman—arrest all of them. They've made my daughter pregnant."

"Darling, you're exaggerating," said Mr. Weston miserably.

"You shut up, you lecher!" cried his wife, renewing her command to the wretched traffic policeman.

Rupe hesitated and before he could renew the assault a large and very feminine whirlwind burst onto the scene in the person of Bridget O'Neill, the bakery cook. Waving a rake about her head she shouted, "You're not arresting nobody, you Sassenach, until you've made an honest woman of *me!*" She swung the rake-handle at his head, neatly removing his cap as he barely ducked.

"I ain't done nothing!" Rupe protested, ducking another swipe that caught Abby Weston squarely across her neat derriere.

Mrs. Weston moved in against this new assault and wrestled with Bridget for the rake, just as a flashbulb exploded from the doorway below. Nate Springer, publisher, editor, printer and staff of the *Leithton Clarion-Bugle,* entered, licking his lips and saying, "Thanks, people—now let's have the facts for the paper."

"You wouldn't dare!" shouted Mrs. Weston furiously. Suddenly she burst into tears, laid her disheveled head on her husband's plucked-pigeon breast and began to sob, gasping, ". . . and in my delicate condition too."

"I'll call in your notes if you print a word of it," said Mr. Weston with a sudden show of mock bravado.

This time Connie stepped into the picture with, "Oh no you won't, Mr. Weston—not unless you want me to send a full report of the Leithton Feed Amalgamation to the Government."

Mr. Weston promptly wilted and Nate Springer, with a smile, hung camera over shoulder and fumbled for paper and pencil. "Now," he said, "the facts, ma'am."

It was Hilde's turn again. She said, "I think you'd better check with your own daughters, Did and Dody, before you print a word of this."

For a long moment the newsman was paralyzed. Finally he managed to croak. "You don't mean my little girls . . .?"

"Sure," said Hilde. "Why should they be exempt?"

"And Rusty Farnum's responsible for all this?" said Mrs. Weston with something like awe.

"He can't be!" cried Abby.

"He is—in a way," said Hilde.

"Let's get him—let's string him up—let's run him out of town on a rail!"

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shouted Bridget, once more brandishing her rake.

"Oh no you don't," snapped Mrs. Weston. "If Rusty's responsible for my daughter's condition he's going to marry her."

"But, mother!" protested a suddenly horrified Abby.

"And how about *my* condition?" cried Bridget.

FOR answer, Mrs. Weston grabbed the rake handle and rapped her sharply across the top of the head. Bridget collapsed like a full sack of flour. Scaling her recumbent form, Mrs. Weston, still brandishing the rake, marched on out, followed by her husband and Abby, Angus and Nate Springer. Rupe, his officerial duties forgotten, was kneeling beside his Bridget, holding her head in his lap.

Hilde raced down the stairs, grabbing Angus by the elbow. She said, "Come on—we've got to keep Rusty from being lynched."

Angus came with her reluctantly, with Connie and Ferris trailing. He said to Hilde, "But how can Rusty . . .?"

"He admitted it to me just now, you big goon," said Hilde, beyond all thoughts of her own emotional life. "He rigged a deep-freeze electric eye in his doorway and has been giving the women of this town free parthenogenetic treatments all summer."

"Good lord!" cried Angus, thunderstruck. "This may be the biggest thing since—since Fermi smashed the atom." Reluctance forgotten, he began dragging Hilde after him as he raced toward the pharmacy.

As they rounded the corner into Grange Street they stopped abruptly, causing Connie and Ferris to bump into them from behind. Then, as one person, all four of them raced for the pharmacy.

The scene before them was appalling. A swarm of women, abetted by irate twains and husbands, was storming the door of Rusty Farnum's drug store. Already the offending doorframe had been wrecked, the door itself torn from its hinges. Rusty was putting up a fight with all of his strength, but was slowly being pushed back inside by the sheer weight of the numbers against him. Angry cries and shouts provided a grim sound-track for the action.

But even as Hilde and the others ran toward the struggle, Mrs. Weston, a truly titanic figure, began forcing her way forward through the crowd, laying about her with the rake-handle as if it were a scythe. She finally reached Rusty, felling him with a final blow, then turned to face the others like a plump doe at bay. "Cut it out!" she screamed. "This isn't going to help any of you. I'm in the same boat!"

The crowd fell back, uncertain, and Hilde and Angus were able to get through it to stand beside Mrs. Weston, who bestrode the fallen body of Rusty Farnum, a Gothic warrior's mate at bay. She said, "Go on home, all of you. Now we know what's happened we can work something out. You'll hear from my husband tomorrow."

There as a mixed mutter from the crowd, then Sarah Gillis, who seemed to have led the assault, pushed back the hair streaming down over her forehead and said, "What about him?" pointing an accusing finger at the recumbent Rusty. "What are you going to do about him?"

"Don't worry—he'll be taken care of," snapped Mrs. Weston. "Now go home—all of you. It's going to be all right."

Later, driving back from the Weston mansion in Angus' modest sedan, Hilde said. "I suppose the Westons' working out a foundation for the unborn babies will do the trick."

"It's going to cost them plenty," said Angus. "But when I think of this experiment—the first known successful human parthenogenesis—and the fact I can't even write a paper on it, I'm sick. And that gadget of Rusty's destroyed. He may have hit on the right combination by sheer luck—they may never get it again."

"Here's one gal who hopes they

(Concluded on page 129)

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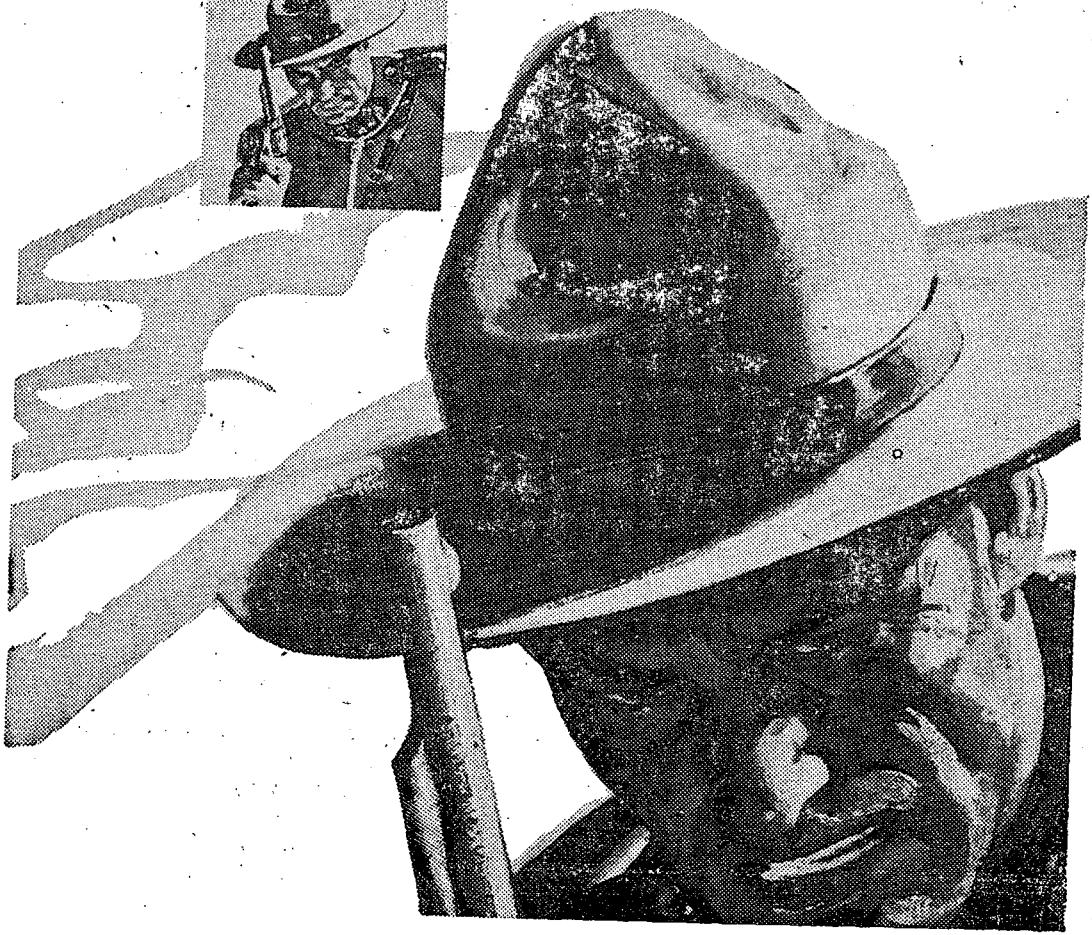

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THE ETHER VIBRATES

(Continued from page 9)

metric transformation. Compare this with the original symmetric transformation, the transformation of an object to its mirror image. Every object has one and only one mirror image, and every point in that object has one and only one corresponding point in the mirror image. (Don't get funny with me, Sam, I'm using only one mirror.)

Furthermore, if you use your imagination a little you can see that the mirror image of a mirror image is the original object—remember any of the comedy movie scenes where one character pretends that he's the mirror image of another? So the mirror-image transformation is bi-unique and self-inverse—that is, symmetric, which we knew already.

Incidentally, the N-transformation isn't the only symmetric transformation we can perform on numbers. Take a look at the reciprocal transformation. The reciprocal of "five" is uniquely "one-fifth," and the reciprocal of "one-fifth" is "five." The reciprocal of a number is defined as the quotient of "one" divided by that number). So the reciprocal transformation is also symmetric.

Now—we are ready. We follow in the footsteps of Dr. Gunther and define the CT-transformation for logical statements. To form the CT-transform of a statement we make no change in the subject and we replace the predicate by its "total negation," to use the terminology of Dr. Gunther, or its "N-transform," to use my own terminology. But—is Gunther's total negation" equivalent to my "N-transform"? Well, he implies that every predicate has one and only one total negation, although he points out that in most cases it is practically impossible to find this total negation, and he also implies that the total negative of the total negation of a predicate is the original predicate—in fact, this is the way he proposes to translate the statements of a seetee-minded alien.

So Gunther's total negative transformation is a bi-unique, self-inverse transformation, and I can define the N-transform for predicates as being the same as the "total negative".

Dr. Gunther says he knows the N-transforms of a few predicates. The N-transform of "in" is in the statement "Mr. Gunther is in," is "not in." This is achieved, he points out, by adding the negative "not," and since I am letting Gunther define the N-transform for predicates I have no choice but to agree.

He also says he knows the N-transform of "green," which he says is "purple." How does he arrive at that conclusion? Very simply. He already knows a symmetric transformation that can be applied to colors—the complementary transformation. Every color has one and only one complement, and every color is the complement of its own complement. Since the transformation he has chosen has all the necessary properties of the N-transformation, he says it is the N-transformation, and I therefore must accept this definition. Of course, he could have chosen any other symmetric transformation on colors, and I would have accepted it with equal ease. He could have just as easily defined colors in terms of their component wavelengths and performed one of a number of symmetric transformations on those wavelengths. (I'm not being sarcastic, Sam. I'm being open-minded.)

Next, Gunther tries the N-transformation on political affiliations, and fails. Why? He says it's because he doesn't know all the predicates—i.e., he doesn't know all the political parties. Nonsense, Gunther! Do you know all the colors? Ask any woman, she'll be able to name and distinguish half a dozen colors you never heard of and can't tell apart. No, Dr. Gunther, the reason you can't apply the N-transformation to political parties is that there is no ready-made symmetric transformation on political parties that you can seize on and define as the N-transformation.

Gunther has been barking up the wrong tree. He tries to translate the CT-transform of a logical statement by using the fact that it is self-inverse, and runs into trouble because applying the CT-transformation to statements—that is, applying the N-transformation to predicates—is an extremely difficult thing. He overlooks the utility of the simple fact that the N-transformation, and therefore the CT-transformation, is bi-unique. Every statement has one and only one CT-transform; every CT-transform has one and only one inverse CT-transform (i.e., original) and we can use this fact to build up a hard and fast table of transforms—that is, a dictionary—and use it to translate one language into the other.

Let me give you an example. Suppose that the alien does not speak English, and we try to teach it to him. We point to a green hat, and say "This is green." The alien sees green, interprets purple, in his own language; then takes our word "green" as referring to his concept of purple and says, "This is green." We have no trouble at all. But suppose that the alien, already, by some strange coincidence, speaks English to begin with. Then he would point to the hat, and say, "This is purple."

We would see a green hat, take a little notebook out of our pocket and write down the transform-pair, "green—purple." Next time the

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alien said "purple' we would look it up and see "green" next to it, and interpret his statement as meaning "This is green." Not only that; we have killed two birds with one stone, because when the alien points to something else and says "This is green," we can look up the same transform-pair and interpret his statement as meaning "This is purple." Learning to communicate with a seetee alien is easier than learning German—the transformation from English to German is not bi-unique. And we have done this without ever trying to derive the total negative of any predicate.

Furthermore, unless the alien speaks English before making contact with us, which is an extremely unlikely possibility, we have no way of ever knowing whether or not he has a settee mind! Suppose for the sake of argument that he does. Then to learn to communicate with him we would have to perform two transformations on what he says. One transformation is the transformation from his language to ours, and the other is the CT-transformation. But the language transformation is unknown when first contact is made; we would have to learn it by contact with the alien; and the transformation that we would learn would not be the language transformation, but the combination of the language transformation and the CT-transformation. This combination is indistinguishable from a pure language transformation.

We are thus forced to the conclusion that Gunther's concept of seetee logic is interesting speculation, but of no practical consequence, except insofar as a scientific interpretation of that concept assures us that it will not give us any trouble in communicating with alien beings from other worlds. I should like to see what Gunther has to say on other topics in logic.—*3 Ames St., Cambridge 39, Mass.*

Dr. Gunther replies to both letters:

Dear Sam: I have read the letters of Mr. Cameron and Mr. Brilliant. They are both interesting, intelligent, and what is more, make a very valid point—so long as one believes only in two-valued Aristotelian logic. Then Mr. Brilliant's N-transformation is indeed self-inverse.

My point, however, is that the problem of understanding an absolutely alien mind requires a non-Aristotelian logic and in such a logic the N-transformation would *not* be self-inverse. The following tables will show what I mean.

I

A	Non-A
P	N′
N	P

II

A	Non-A	Non-A
P	N′	P
N′	P	N″
N″	N″	N′

In the first table the fields of P and N are isomorph and in one-to-one correspondence. This the letter writers have obviously in mind. And insofar as their reasoning is based on Table I they are perfectly right. But, as soon as you transfer the properties of Matter to the Mind, the very same system appears as a three-valued logic (II) and here P is confronted by the two N′ and N″. This ruins the self-inverse character of the N-transformation. This is already indicated by the non-symmetrical structure of implication:

r	q	r q
P	P	P
P	N	N
N	P	P
r	N	P

P implies only itself but N implies itself and P.

Mr. Cameron writes: "The only remarkable thing about anti-matter is that if it were brought into contact with ordinary matter a mutual annihilation would take place, with the mass being converted into energy." Well, Mind is, in a manner of speaking, anti-matter. And if the structure of matter is repeated in mental operations, another conversion takes place—from Aristotelian to non-Aristotelian logic.

I feel I should conclude with a sincere apology to Mr. Brilliant for being a metaphysician.

There could be nothing worse. Even a communist might finally see the light, but a metaphysician, never!

Gotthard Gunther

VIEWS AND REVIEWS

by H. Maxwell

Your Eminence: Some of my world-shaking views on this and that, also them. . . .

SCIENCE FICTION: Readers of the big circulation slicks are predominantly conformists, upholders of the status quo, while S-F fans are predominantly noncomformists, despisers of the status quo. Hence, big-slick yarns must corroborate current majority beliefs.

But in S-F, any editor who wishes to avoid early assassination must print yarns which exemplify nonconformist viewpoints. Corollary: you can't sell our kind of science fiction to the mawsses. Again: humor in S-F annoys some fans because your true hot-blooded rebel resents seeing rebellion against conformity made the subject of levity.

WOMEN: It has not been sufficiently recognized that much of woman's appeal results from color contrasts rather than from curve contrasts. Women, of course, know this, as indicated by their pre-occupation with their

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paint jobs, dye jobs and camouflage jobs. I believe that when a male's feverish glance chances upon a comely wench his first pleasurable reaction derives from appreciation of the pleasing aspects of her curvature tickling his cortex a split second later. Of course, this may only be because color values can be recognized instantly, whereas curve values, due to the complexities of the female form, require close and detailed study before they may be adequately appraised.—*354 West 56th St., New York 19, N.Y.*

We observe with relief that no one has slipped friend Maxwell that overdose of DDT mentioned in the last issue, since his writing arm seems still to be unparalyzed. There was more to his letter—much more—but we mercifully liquidated it. Incidentally, his theory about female color is undoubtedly true, but no earth-shaking discovery. We noticed it ourselves about forty years ago.

ALWAYS THE OPTIMIST

by Jerold N. Krempel
PHAN 436-44-87

Dear Mr. Mines: The "Ether" in January SS was (paradoxically) most refreshing. I counted three letters having purpose and coherence, and found signs of intelligence in several others. Although I have no stomach for the Saturnian brand of hogwash, I think Mr. Clements is to be especially congratulated for his lucid comments and fatherly advice to Miss Behrman. It takes a cool head to deal with a hot problem.

There's just one little correction I'd like to make: the piece spoken by Walter Scheps was headed "A Little Vituperation." Now, it's always been my understanding that if The English Language can still get up and walk after one is through with it, one has not been vituperative (cf. H. L. Mencken and Brann the Iconoclast). Scheps' grade-school essay doesn't qualify because he left the Mother Tongue untouched. To use the classic expression, "He came into the battle of wits unarmed."

Keep pitching, Mr. Mines; there are better days ahead.—*U. S. Naval Air Rocket Test Station, Lake Denmark, Dover, N.J.*

This promise of better days is the only thing that keeps us staggering along from day to day under our weary load. So you thought Scheps' letter wasn't vituperation because the paper held up that it was written on? Don't forget it was for publication, not army talk. Wonder what the Rocket Corps will come up with in the way of new vocabulary?

TIME WARP

by Thom Perry

Dear Sam (familiarity breeds contempt): First, a complaint; I wrote Willy Conner, who has a letter in teaevy in the January issue, addressing my masterful missive to Route Three, Chillicothe, Iowa, and the letter comes back with UNKNOWN stamped on it. And Conner asks for correspondents! Mr. Conner, I dare you to write me at the address indicated below. At dawn, typewriters and coffee for two.

Sam, really, that January cover isn't nothing not to boast about. Isn't the girl out there in vacuum? Then why does she look as if she was under pressure? Is she holding her breath?

I heartily agree with Conner about Kendell Foster Crossen. At the first available opportunity I intend to pour hydrogen oxide into his coffee. May nameless benedictions pursue his divinely accursed soul to The Snake Pit! (That phrase in MY OLD VENUSIAN HOME: ". . . the acceleration needed to leave Earth." Great Rah, Sam, don't you know better than *that?*) "Throw the science out of science fiction" indeed! And his reason: he doesn't like *Ralph Et Cetera!*

I won't comment on your stories, because I stopped reading your stories several months ago. The ethergrams have been carrying your mag ever since *Halos, Incorporated.*

As your reader, I have a brilliant suggestion: Turn the entire mag into a letter column! Call it THE VIBRATING ETHER (never name a mag a sentence) and print all the letters from all the Thrilling books in it. Better yet, merely put a STARTLING STORIES section near the back for the fen to write (and gripe) about.

Another suggestion: put POGO in SS. Unscientific? You print Crossen's junk. You printed NEVER TEMPT THE DEVIL, didn't you? And POGO COULD be scientifictionic; get Walt to write a short piece on how the Federated States of North America put a atomic pile there during the Third World War, it blew up, caused the swamp critturs to mutate. Then the Camp hit a Time Warp, and through the whole thing got back into the present.

In fact, POGO is more (and better) stf than Crossen's writings; the strip rarely is unscientific, save for the sake of humor, for instance, Albert picking up a board that he's standing on. (Nothing unscientific about pulling oneself up by one's bootstraps, in fact; recall FIND THE SCULPTOR?)

In closing, I would like to ask for correspondents.

I play chess, love Heinlein. POGO, Charteris' Saint, and general stf. I'll even play baseball by mail, if someone will give me a slipstick accurate to 10,000 places.—*4040 Calvert Street, Lincoln 6, Nebraska.*

What's so wrong with the phrase "acceleration needed to leave Earth?". He meant

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escape velocity, that's all. Hair-splitter. You think this letter is good evidence that SS should be all letters? Hah.

MUSE MOUSSE
by Wanita Norris

Dear Sam: A comment on the poem in the Spring issue. I just got one back with a criticism that I rhymed "rain" with "again." I see that Kulik has rhymed "God" with "hard." Oh!! Such frustration!

By the way, if there are any males who don't think a girl is nuts because she likes S-F and parapsychology (there don't seem to be any around here) I wish they'd drop me a line. Gals are welcome too, of course. I'm awfully tired of finding nothing but ads and bills in my mailbox.—*4217 Central Dr., Fort Wayne, Ind.*

GLAD TIDINGS
by Wm. Deeck

Dear Mr. Mines: The day of reckoning is here. I have been cast into the back page of SS with the other ones who have laid the heavy hand of criticism upon your magazine. You must have been listening to your advisors (the people who argue about birth control and large families) who hate people who bring up pertinent altercations. If you can't pay any attention to me, why listen to them. I'm smarter (just ask me, I'll tell you).

Well, I'm getting out—enough is enough (and besides that, it's logical). Never again will you receive a letter from me—though I will still read SS, if only to laugh at the idiots showing their ignorance in the back pages; and to see if you have succumbed to popular demand (at least three letters) to get a story from T. P. Caravan. This will make the Captain Future fans happy, and God knows they need something to brighten their endless days of begging.

Do not think I'm saddened by this. My head is held high as I think of the magazines deprived of my genius; they will accept me with no reservations. I went through approximately 8 months of SS without one convincing argument raised against me—all I got was sneers. So, farewell! (Don't ask me to come back, I might do it.)—*8400 Potomac Ave., College Park, Md.*

P.S. I was drunk when I wrote the first letter.

Do we really want Deeck to go, fellers? Imagine having no one to blame for this and that. This way, whatever goes wrong, you can always say it's Deeck's fault. On the other hand if we ask him to come back he might do it. Sacré! quel dilemma!

IDEALISTICALLY YOURS
by Vivian M. Hutchins

Dear Sam: Joe Keogh's letter got me

[*Turn page*]

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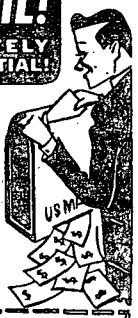

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started thinking about cynics and what makes them tick that way. Seems to me most of them are pretty immature emotionally. They go all out on erudition and rationalization, but they don't make much sense.

The main basis for their attitude seems to be the "Great I am," which is all very nice, but there are a few others on this cosmic pinpoint of ours who can think, too. And they don't make anywhere near so much noise about it. The "Everyone is out of step but me" attitude doesn't get you very far in the long run. It's easy enough to sit down and figure out all the things that are wrong with the world and people, but it is quite another matter to try and change everybody to suit your findings.

That is the whole basis of the Christian religion, but how many professing Christians actually try to live up to their creed on a day to day basis? I'll bet the percentage is so small that it would be an awful shock to most.

A few will listen, but the majority go bumbling along in their own way. The funny part of it all, is that the bumblers usually get along pretty well with life while the cynics frequently end up on the psychiatrists' couches. (Or should).

I'm not saying you should give up your constitutional and intellectual freedom to yell bloody murder, but did you ever stop to think that the other guy might have some good reasons for his attitudes? Tilting at windmills and knocking down straw men doesn't solve anything. Set your sights on a real target and maybe you get somewhere. Maybe that's the difference between an editor and a writer of letters-to-the-editor. You do a good job as referee, Sammywell. Your editorial asides are better than the letters. Short and to the point, and thanks for avoiding the cyanide capsule style.—*P.O. Box 113, Denville, N.J.*

The trouble is, of course, that while everyone knows what emotional immaturity is, it is always something afflicting the other guy. Ever have the nightmarish experience of hearing a friend of yours condemn someone bitterly for something he does himself all the time? He recognizes it all right when someone else does it, but not when he does it himself. And—who, me? You're kidding!

CLEAR AS CLEAR
by Walter Scheps

Dear Sam: What was that Mother Goose tale doing in the lead novel spot? No characterization, no plot, nuthin'. Are you sure this is the same Vance who wrote BIG PLANET and HARD LUCK DIGGINGS? It wasn't even a novel, only forty-six pages. Thank Ghu for that. And what happened to TEV? Not one humorous letter in the lot except for the poor guy who got two westerns in his SS and that wasn't supposed to be funny.

Why didn't you print my wonderous ode? Don't you know I may become frustrated and never write to you again? The cover was breathtaking. No name but only Schomburg can draw that-a-way. While on the subject of illos the Finlays on pages fifty-five and eighty-seven were superb. Also the cartoon. Hah, hah. More? Agreed with your editorial, also with Mr. Christoff. Serials are for the birds and/or so called slicks. Enjoyed the Seetee Mind article. Reminds me of some of my relatives.

M. Desmond Emery: If religion were allowed to run rampant in TEV here's the type of letter you could expect to see: "I enjoyed the latest SS and will all Animists in the Mindanao region please get in touch with me as I am organizing an Animism and SF Borscht Slurping Klub. We will attempt to further the effect of borscht on the primitive peoples of Azerbaijan. We are also holding a box luncheon next Tuesday. Tickets are twenty annas a head and the boxes should prove quite tasty." No, religion doesn't belong in TEV. I hope to make myself clear.—*1102 Longfellow Ave., Bronx 59, N.Y.*

Is Borscht Slurping a religion now? And who told you that the tale of the reader who got two westerns in his SS wasn't supposed to be funny? Egad, do we have to include diagrams now?

CRUSADE
by Ron Ellik

My goal has been set; the Cause is ascertained; the Mission is on its way; the Unholy War is declared!

My Cause? To get a letter (a whole letter, mind you) printed in The Ether Vibrates. Tom Piper did it. Leo Gleicher did it (altho you cut his horribly, sez Leonardo.) Forry Ackerman did it. Ellik too can do it!

Really, Sam, it's disgusting. Three times you is done gone and run my name in that little column at the end of TEV, three times denying your readers (I laughingly call them readers) the brilliance of my utterings (he laughingly calls them utterings—Ed.) (you *were* going to say that, weren't you, Sam?—Ellik.)

To thish, the Spring '54 number, anyhoo:

Jack Vance is slipping. The whole plot came to me in a flash from Ghu on the bottom of page 28. S'help me, Sam, it's the truth. Right there I figured the geek had had seedlings pushed into the open wound on his headbone.

IF VANCE ISN'T KUTTNER HOW COME HE (Vance) KNOWS SO MUCH ABOUT SOUTHERN CALIF.? No, I'm not another who claims he is, but it does strike me as funny he's so cognizant of the locale (Sam would probably like to strike me, and not very funny, either).

Tell Samuel Johnson a line is not a series

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of points placed side by side but a moving point. Anyhoo, the line he sees is a physical representation of something that cannot exist, but has to be represented to give geometricians something to work with. Even a jackass like me knows that much. I's gone and done been surprised at you, Sam, for not knowing a thing like that. Fine SCIENCE fiction editor.

I wanna put in another plug for Jack Connell, Sam. His address is PO Box 2808, Aukland C. 1, New Zealand. He's a little weak-sighted, and has the largest lending library in that area. He needs stf mags and books, and would appreciate fanzines, to help him keep his library up (it operates by mail), so that he doesn't become a drain on the state. A real stf-minded patriot, thass him.

What in the name of Xeno ever happened to Magnus Ridolph? Vance has a good thing there; almost as good as Manning Draco. For that matter, whatever happened to Xeno? (For this I get a blast from the Salt Mines.)—*232 Santa Ana, Long Beach 3, California.*

How many times we got to explain that Vance knows so much about Southern California because he lives there? Fact, he probably lives there longer than Kuttner, because Kuttner used to live in Westchester, which is a suburb of New York for the benefit of all people living in Long Beach, Cal. And if you, Ronald, ever bring up that Vance is Kuttner stuff again, we will send you the last remaining jug of Xeno left here after Sarge Saturn's hasty departure. A horrible fate. But none too good for you.

As usual, letters left and small space. Hold your breaths while we run down the list. Dale Wilson, 11 Summit Ave., Sault Ste. Marie, Ontario, says injuredly that he is a Mr., not a Miss. Sorry, kid, but we do know a gal named Dale. He still wants correspondents. A Russel Jones, 125 Virginia Rd., Oak Ridge, Tenn., wants a copy of the Aug. '52 issue of SS with THE LOVERS. Rory M. Faulkner, 164 Geneva Pl., Covina, Cal. says the ads are as much fun as the stories and commends them to the readers.

James Chamlee, 208 North 9th, Gatesville, Texas, announces a new fanzine called ZERO. Twenty cents, he hopes to get. Ev Lawrence, 104 Lake Ave., Ithaca, N. Y. says Vieve Masterson and all the other gals who demand equal rights aren't quite as willing to assume equal responsibilities. Offers them a job laying railroad ties. Seems to us in Russia they do, no?

[*Turn page*]

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John Walston, Vashon, Wash. expects to inherit a couple of million dollars from his rich uncle Thaddeus Q. Smallchange and buy Standard's S-F magazines. Bill Annette, 15842 11th Ave., S.W. Seattle 66, Wash., wants correspondents. Nathan Dodge, 2009 West 10th St., Dallas, Tex., says he is handsomer than Deeck and wants Carol McKinney to be the judge. Jim Harmon, 427 E. 8th St., Mt. Carmel, Ill., says he has reformed. No more personal questions like are we really Captain Video. He will be crisp, direct, constructive—the perfect fan.

We-el-l. . . .

Bobbie Burgen Fey, 259½ E. Livingston Ave., Columbus 15, Ohio, is an addict of only six months and having a wonderful time with SS. Martin Jukovsky thinks Video-Technics gets too far afield from science-fiction occasionally, though many columns have been good, likes the movie reviews and the poetry.

Don Allen, 3 Arkle St., Gateshead 8, Co. Durham, England, wants to know how Popp's females can live in space without a space-suit.

Simple, Don, the female is tougher than the male.

Charles Peterson, Faribault, Minn., thinks Deeck's letters "reek of the psychoanalytical smell of an insecure attention craver." H'mm. He likes Carol McKinney though, Who doesn't? W. F. Link, 1123 Cumberland Rd., Abington, Pa., has some wry words to say about the difficulty of finding pulp magazines on the periodical racks. Says SS is so much better than its package would lead one to believe that his little heart is breaking. Morgan Harris, Littlejohn Lane, Cookville, Ont., Canada, likes the novels better than the shorts, wants more articles, cartoons, poems and the fanzine review and correspondents. Phew! Gilbert Menicucci, 675 Delano Ave., San Francisco, Cal. saw a picture of us in FANTASTIC WORLDS and was amazed. He'd pictured us short, fat, bald, with a cherubic smile and a briefcase showing the bloody heads and hands of fans sticking out.

How do you know that picture was really us?

George Kinloch, 2715-82nd Ave., S.E., Calgary, Alberta, Canada, is discouraged. Everybody in TEV is up in arms, making wild remarks with nothing to back them up. Wants facts and is willing to take on anybody who wants to argue about Deeck, or Crossen, or Barbara Behrman. Bill Schwarzer, 204 Red River, raves about THE TIME MASTERS, and spares a kindly word also for Crossen, Shallit and Slotkin. Thinks sexy covers help any magazine.

Paul Mittelbuscher of Sweet Springs, Mo., thinks there is no place for humor in science fiction. Fantasy yes, science fiction, no. Sgt. Charles F. Neary, RA32411240, Hq. & Hq. Co., 14th Inf. Regt., APO 25, c/o Postmaster, San Francisco, California, writes that his June issue of SS is worn out from passing around but still wonderful. If anybody has any back copies of SS, here is a boy who will really appreciate them. Mark Andrews, 197 Fairway, Sherwood No. Little Rock, Ark. reports his deep disappointment in fandom. Says fans should talk about S-F, not gossip about each other.

James Brook, 545 W. 111th St., New York 25, N.Y., says time travel is impossible because you would have to go back in space as well as time, since the earth is moving. That hasn't been overlooked, James, most S-F writers invent time machines will travel in space and time together.

George C. Somerton of Amherstburg, Ont., Canada is flabbergasted at the improvement in SS in the past few months. Marsha Hearst, 1718 Yale Ave., Richmond Hts., 17, Mo., wants to know if our anthology THE BEST FROM STARTLING STORIES will be printed in magazine form. Baby, all those stories were *originally* printed in the magazine. Thass whut our anthology is. Sgt. Don McGreevey, RA12262611, 27th Inf. NCO School, APO, San Francisco, Cal. believes sex is here to stay until we find something better. Who's looking?

Bill Shirey, 4566 Clay St., Fresno, Cal. is gloomy about our quarterly publication, lives for the day when SS goes monthly again.

Harold Kohen of 2920 Pingree, Detroit 6, Michigan, is desperate. He wants to start an S-F club and can't find anyone in Detroit to join him. Must be some fans there. Tom Condit—oh, no, not Tom Condit again! Frances Cloud, 12095 Poplar Ave., Santa Clara, Cal., likes Snarly and Deeck—says there's nothing wrong with

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them that a little formaldehyde wouldn't cure. We like her too, she thinks our answers are better than the letters. Oh, and she wants to start a fan club in Santa Clara.

Any takers?

Bob Stewart, 1508 Monroe, Commerce, Texas, says what SS needs is him—to write the stories no less. Frank R. Williams, 3320 Palm Drive, Hermosa Beach, Cal., thinks S-F and jazz go together. Both USC and UCLA give credit courses in jazz. But not science fiction?

Well, you've had it. Look for you all back here in the next issue.

—*The Editor.*

SUMMER HEAT

(Concluded from page 120)

won't," said Hilde. "Poor Rusty—and poor Abby."

There was brief silence. Then Angus said, "At that, in having to marry each other they're getting about what they deserve."

"I thought that you liked Abby," said Hilde.

"I tried," said Angus softly. "Lord knows I tried. What could I do when you wouldn't even give me a tumble?"

"You big idiot!" said Hilde, reaching for the ignition switch and turning it off. "You never even made a pass."

"Besides," he muttered while letting the car glide to a stop alongside the road, "you're too damned big."

"You might try cutting me down to size," said Hilde.

Answers to Quiz on Page 108

1-e, 2-i, 3-f, 4-k, 5-h, 6-j, 7-c, 8-l, 9-b, 10-g, 11-a, 12-d.

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WILLIAM LUNDIGAN

United Artists

Riders to the Stars

IN A remarkable advance over previous efforts, the Tors-Carlson-Siodmak triumverate has turned out an stfilm worthy of praise. While the *United Artists* release, *Riders to the Stars* may fall short of classic stature, it brings to the screen a maturity and solidity of concept which has been too rare in the past.

Taken from the novel by Curt Siodmak, it shows the effects on three specialists of the first manned rocket trip to the stars. Hand-picked from scores of possible candidates, William Lundigan, Richard Carlson and Robert Karnes are chosen to make the flight.

Experiment with unmanned rockets has shown research scientist Dr. Stanton, played by Herbert Marshall, that the hardest vanadium alloy crumbles to pieces when exposed to the bombardment of cosmic rays. To make space travel possible, some shield must be devised that will resist this effect.

A meteor swarm is spotted just beyond the Earth's atmosphere, and the three men, with special equipment, are sent out like butterfly catchers to bring home samples.

By determining what chemical composition protects the meteors, their problem may be solved. Lundigan, playing Stanton's son, has a special incentive in the person of pretty Martha Hyer, for shooting for the stars. Carlson and Karnes volunteer for the trip for reasons of their own.

In a series of realistic shots, we watch the three go their separate ways—each to meet a special problem of space travel. At the cost of two lives, the experiment meets with success. For the effectiveness of these scenes, Special Effects Director Harry Redmond, Jr., and Jack Glass, responsible for photographic effects, deserve a special commendation.

The shots showing the physical effects of increased gravity are among the best sequences that science fiction has shown on film. We'll look for more in the future.

—*Pat Jones*

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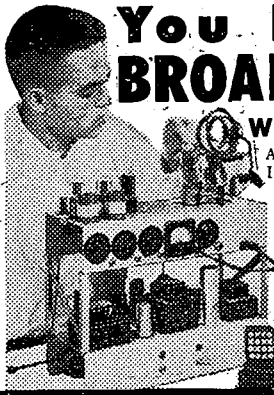

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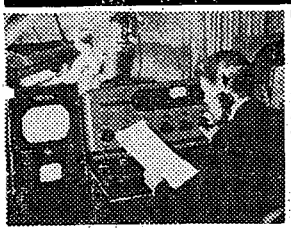

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